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CAMINO-101 [Class B AIS]

User's Manual

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Version 1.83

WARNING!

FOR USERS IN THE UNITED STATES OF AMERICA ONLY

WARNING: It is a violation of the rules of the Federal Communications Commission to input an MMSI that has not been properly assigned to the end user, or to otherwise input any inaccurate data in this device.

★ The entry of static data into this device shall be performed by the vendor of the device or by an appropriately qualified person in the business of installing marine communications equipment on board vessels.

★ Instructions on how to accurately enter and confirm static data in the device can be found in Section 3.3 of this user manual.

The equipment said in this manual must only be used to which it was designed. Improper operation or installation may cause damage to the equipment or injury to personnel. AMEC will not incur any liability of equipment damage or personal injury due to improper use or installation of the equipment. It is strongly recommended to read this manual and the following safety instructions before proceeding to installation or operation.

SAFETY INSTRUCTIONS

WARNING
ELECTRICAL SHOCK HAZARD. Do not open the case of the equipment. Only qualified personnel could work on the interior of the equipment.
TURN OFF THE POWER IMMEDIATELY IF WATER LEAKS INTO THE EQUIPMENT OR OBJECT DROPS INTO THE EQUIPMENT. Continue operating the equipment could cause electrical shock or fire. Contact your nearest distributor for service.
DO NOT DISASSEMBLE OR MODIFY THE EQUIPMENT. Improper disassemble or modification could cause electrical shocks, fire, or personal injury.
AVOID OPERATING THE EQUIPMENT WITH WET HANDS. Electrical shocks could be resulted if operating with wet hands.

WARNING
TURN OFF THE POWER IMMEDIATELY IF THE EQUIPMENT IS EMMITTING SMOKE OR FIRE. Continue operating the equipment could cause electrical shock or fire. Contact your nearest distributor for service.
EVENTHOUGH THE EQUIPMENT IS WATERPROOF, PLEASE AVOID DIRECT CONTACT WITH RAIN OR SPLASHING WATER. Electrical shock or fire could be resulted if water leaks into the equipment.
DO NOT PLACE ANY LIQUID-FILLED CONTAINER ON TOP OF THE EQUIPMENT. Electrical shocks could be resulted if the device is contaminated with liquid.

FOREWORD

Congratulations on the purchase of your new CAMINO-101 Automatic Identification System (hereinafter called “AIS”). Wherever you sail now, you can have a better control of your surrounding sea, and have an enjoyable voyage.

Camino-101 AIS is strictly tested to meet the rigorous demands of the marine environment. Unless improper use, installation**,** or maintenance, the equipment should function properly at its optimum.

We thank you for choosing our product and we wish you bon voyage!

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1 INTRODUCTION

1.1 CAMINO-101 Overview

The CAMINO-101 is a Class B AIS transponder using carrier-sense TDMA (CSTDMA) technology. It is designed to be inter-operable and compatible with Class A or other Class B ship-borne AIS stations or any other AIS stations operating on the AIS VHF data link.

CAMINO-101 AIS uses marine VHF channels with frequency set universally from 156.025 MHz to 162.025 MHz. Having CAMINO-101 AIS on board, not only can you monitor the status of the vessels in the surrounding area, but also receive the dynamic information (position, speed, SOG, and etc.), static information (ship name, MMSI, call sign, and etc.), and voyage related information (cargo type, destination, and etc.) from any vessels equipped with AIS. An external computer installed with AMEC AIS Viewer software or an AIS-ready plotter device is required in order to view the AIS information above mentioned.

CAMINO-101 AIS is one of the cutting-edge navigational aid equipments allowing real-time information exchanges within the AIS network. It is also capable of integrating with other maritime systems such as Electronic Chart System (hereinafter called “ECS”) for various maritime navigation applications.

CAMINO-101 is designed with 2 RF receivers and 1 RF transmitter. One of the RF receivers is time-shared between AIS and DSC. On the front panel, CAMINO-101 is equipped with 3 LED indicators. At rear panel, there are 1 VHF antenna connector, 1 GPS antenna connector, 1 optional Bluetooth connector and antenna (CAMINO-101W only), 1 NMEA interface connector, 1 RS232 interface connector (CAMINO-101A/W supports Tx-Off Switch Box via this connector), 1 power connector, and 1 power switch.

NOTE: The CAMINO-101 is an equipment to be used in protected environmental conditions. It is not intended to expose to rain or spray longer than a minute.

1.2 Type of AIS

There are mainly two types of AIS transponder: Class A and Class B. The intended nature of these AIS systems in navigations is different as illustrated in the following table. CAMINO-101 is a Class B AIS transponder.

Table 1-2 Type of AIS

Class A AIS	• Transmits and receives AIS signal in SOTDMA protocols. • Intended for vessels meeting the IMO AIS carriage requirements. • It is mandatory for all commercial vessels that exceed 300 tons to be equipped with Class A AIS.
Class B AIS	• Transmits and receives AIS signals in CSTDMA protocols. • Not necessarily in accord with IMO AIS carriage requirements. • It is not mandatory for vessels to be equipped with Class B AIS. • Suitable for recreational vessels or fishing boats, in enhancing its safety at sea.

1.3 AIS Message Type

The CAMINO-101 transmits following message types.

Table 1-3 CAMINO-101 AIS message type

Type of Message	Data Details
Static Data	Maritime Mobile Service Identity number (“MMSI”) Call sign and name Type of ship Length and beam GPS Antenna location
Dynamic Data	Position of the vessel Course Over Ground (hereinafter called “COG”) Speed Over Ground (hereinafter called “SOG”) Heading
Dynamic Reports	Speed of the ship Status of the ship
SRM	Alarm Safety

1.4 AIS Report Rate

The CAMINO-101 supports following report rates in accordance to ITU-R M.1371 and IEC 62287-1.

Table 1-4 CAMINO-101 AIS report rate

Platforms Condition	**Nominal Reporting Interval**
Class B Ship-borne mobile equipment not moving faster than 2 knots	3 Minutes
Class B Ship-borne mobile equipment moving faster than 2 knots	30 Seconds
Report rate by command of VTS	5 Seconds highest

1.5 About this Manual

The manual contains installation instructions and operating information for CAMINO-101. While most of the installation can be performed by the owner or the crew, a final commissioning can be done by your local agent/dealer when needed or required. AMEC and the local agent/dealer will not bear any responsibilities over any damages resulted in improper installation by unauthorized agent/dealer.

1.6 Important Notice

The intended use of the AMEC CAMINO-101 AIS is to enhance the safety of vessels at sea. However, a few points must be noted as below,

- Any AIS cannot guarantee monitoring and receiving signals from all vessels in the surroundings unless those vessels are equipped with AIS devices.

- It is important to note that the AIS is designed for the purpose of anti-collision and serves as a compliment to navigation. It is not the absolute navigational equipment and does not replace any navigational system installed on board.

- Although AIS operates automatically by itself, the owner or the crew on the vessel should still maintain a proper lookout for the surroundings. While AIS is capable of setting alarms for Distance to Closest Point of Approach (hereinafter called “CPA”) and Time to the Closest Point of Approach (hereinafter called “TCPA”), vessel owner or the crew should be aware of the fact that there are vessels not equipped with AIS, and this function will not apply with these vessels.

- Incorrect data and information entered into the AIS is considered as erroneous information.

Erroneous information or improper configuration will cause risk to both own vessel and surrounding vessels when these information are transmitted. Users must be aware of this risk and ensure that all information entered into the system is correct and up-to-date.

2 INSTALLATION

2.1 General

2.1.1 Safety Instructions

Before proceeding with installation, take note of the following safety instructions and read through this installation manual carefully.

SAFETY INSTRUCTIONS

WARNING

ELECTRICAL SHOCK HAZARD
Do not open the case of the equipment. Only qualified personnel could work on the interior of the equipment.

TURN OFF THE POWER BEFORE PROCEEDING WITH INSTALLATION.
Proceeding with installation with the power on could cause electrical shock or fire.

AVOID INSTALLING THE EQUIPMENT WHERE THERE IS DIRECT CONTACT WITH RAIN OR SPLASHING WATER.
Electrical shock or fire could be resulted if water leaks into the equipment.

MAKE SURE THE POWER SOURCE AND THE POWER INPUT OF THE EQUIPMENT ARE COMPATIBLE.
Damage to the equipment and fire could be resulted if the power **sources are** not correct. Please check the correct power input on the adaptor.

FOLLOW THIS INSTRUCTION MANUAL TO PROCEED WITH THE INSTALLATION.
AMEC and your local agent/dealer will not bear any responsibility of equipment damage or personnel injury due to improper installation.

WARNING

Warning Label
A warning label (Figure 2-1-1) is attached underneath the equipment. Warranty of the equipment will be invalid if this label is detached or broken. AMEC and your local agent/dealer will not bear any responsibility of any damage to the equipment, or damage in related to the equipment, personnel injury, and etc. Reject the equipment if this label is detached or broken. Please contact your local agent/dealer if this label is missing.

Figure 2-1-1 Warning label

2.1.2 Unpacking and Handling the Unit

1. Move and handle with caution. Do not drop or bump.
2. Visual inspection should be taken on the box to see if it is intact.
3. Unpack the product on a flat and level surface.
4. Unpack the box with the lid facing up.
5. Take extra caution if using sharp object to unpack.
6. After unpacked, check if all the accessories and unit are included.

2.1.3 Items in the Package

The CAMINO-101 is typically delivered with standard package as shown in Table 2-1-3-1. It is also illustrated in Figure 2-1-3 (except Viewer CD and manual). Table 2-1-3-2 also shows optional accessories available from AMEC.

Table 2-1-3 Standard equipment list

No.	Description		Qty
1	CAMINO-101 Class B AIS main unit		1
2	Manual		1
3	Installation Kit	Power Cable, 1.5m, AWG 18	1
		NMEA 0183 interface cable, 1.5m	1
		RS-232 interface cable, 1.2m	1
		M6×20 Screws	4
4	Software CD: AMEC AIS Configuration & AMEC AIS Viewer		1

NOTE:

(1)AMEC would not be able to fully ensure overall product performance if longer cable length other than the above specified length is used.

(2)If an extension power cable is required, use large gauge cable to minimize voltage drops.

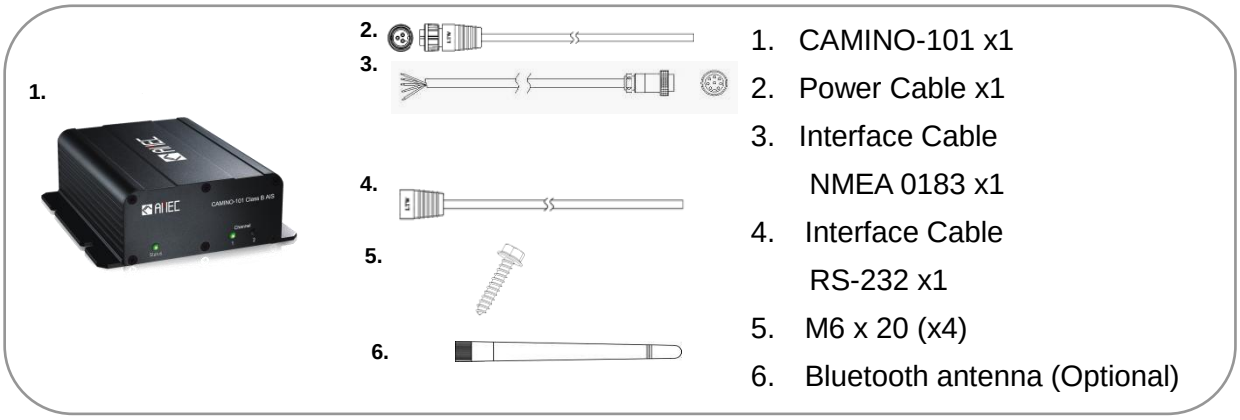


Figure 2-1-3 Package items

2.1.3.1 Optional Supply

Table 2-1-3-1 Optional equipment list

No.	Description	Remarks
1	VHF Antenna	--
2	GPS Antenna	10m cable included
3	VHF Antenna Cable	10m

NOTE: AMEC would not be able to fully ensure overall product performance if longer cable length other than the above specified length is used.

2.2 Installation Procedure

2.2.1 Installation Precautions

1. Installation should proceed in a safe environment and does not have direct contact with rain or splashing water.
2. If it is required to use a ladder to install the equipment, take extra caution and be careful of falling down.
3. Do not place or install the equipment beneath or near any container that filled with water or liquid.
4. Do not place or install the equipment where it is easily tripped, stepped on, or kicked at.
5. Do not place or install the equipment near any generator or engine.
6. When installation is completed, please remember to key in own ship's MMSI data and related information through AMEC AIS Configuration software. Please refer to Section 3.3.

2.2.2 Step by Step Installation Instructions

AMEC CAMINO-101 can be installed and mounted on flat surface, or it can be mounted on wall as shown below.

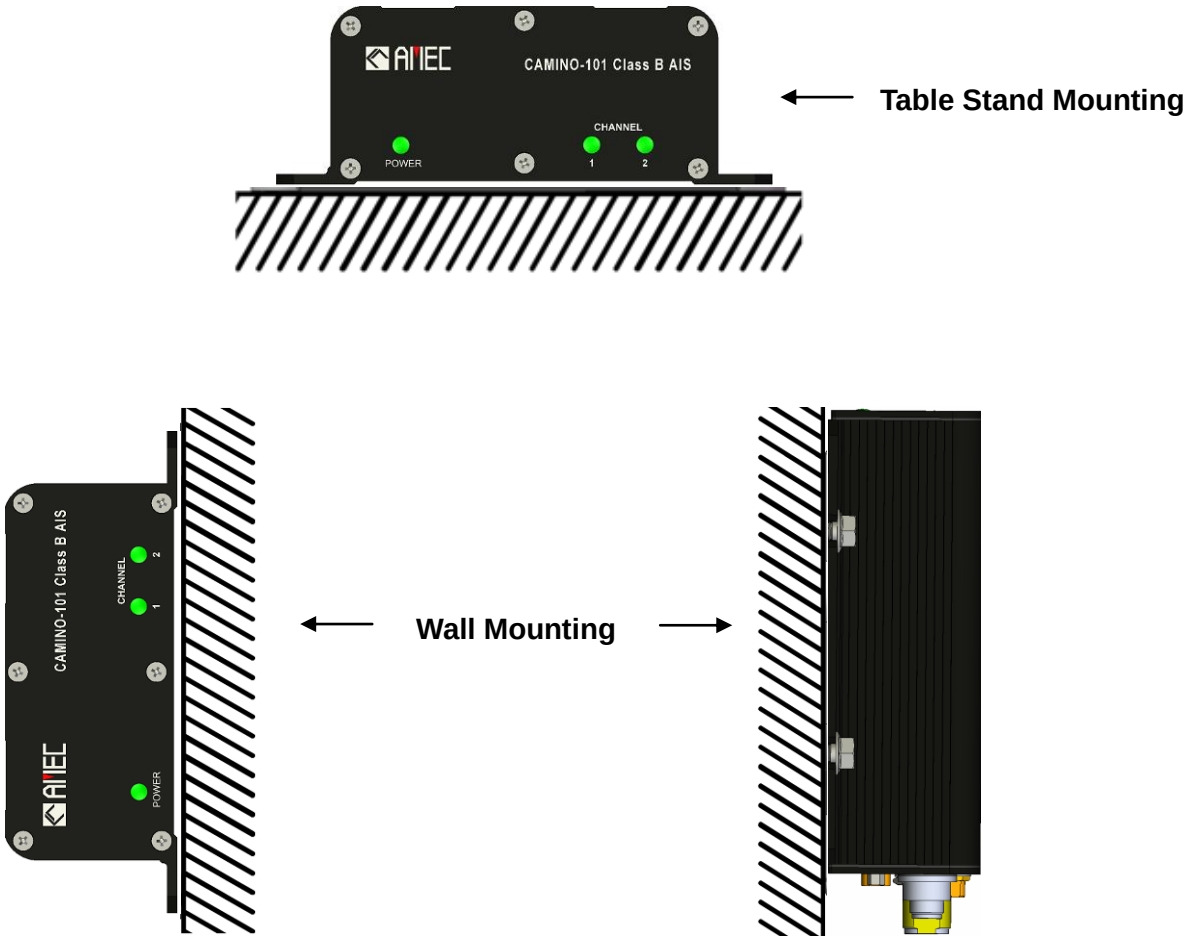


Figure 2-2-2-1 Installation overview

I. Installation Instructions

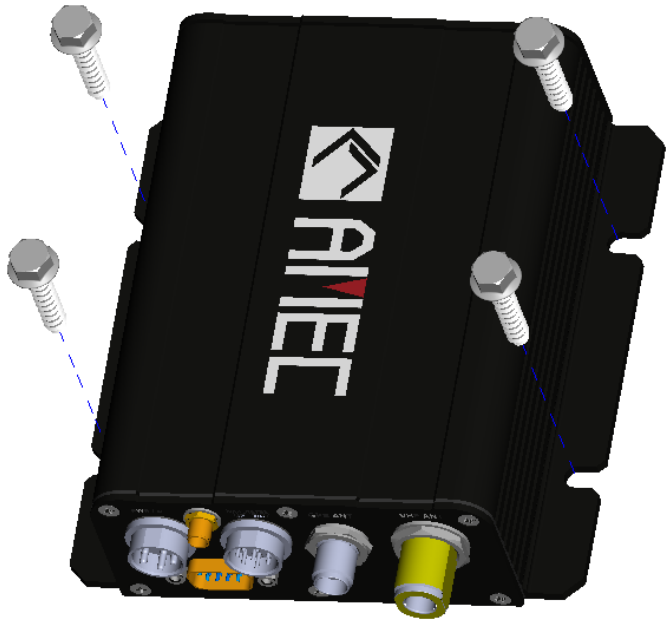


Figure 2-2-2-2 Installation instruction

Step 1:
Place CAMINO-101 on the desired spot for installing. (Refer to figure 2-2-2-2)

Step 2:
Use the supplied M6 × 20 screws from the accessories to mount. (Refer to figure 2-2-2-2)

II. Cabling Instructions

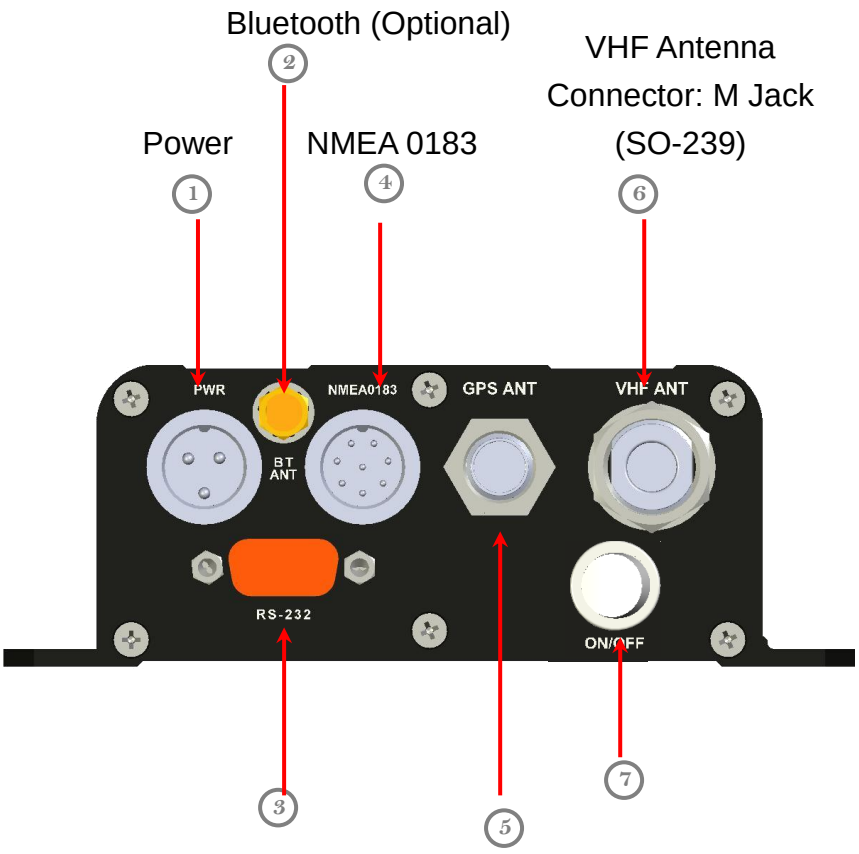


Figure 2-2-2-3 Cabling instructions

Step 1:
Connect the GPS cable to the GPS ANT (5) *

Step 2:
Connect the VHF cable to the VHF ANT (6) .

Step 3:
Connect NMEA 0183 compatible system to the NMEA interface (4).

Step 4:
Connect either RS-232 or Bluetooth antenna to your computer if needed.
*** DO NOT CONNECT THE TWO INTERFACES SIMULTANEOUSLY.**

Step 5:
Pairing Bluetooth to your computer if needed. (Please refer to 2-2-2-3).

Step 6:
Connect the Power cable to the PWR (1).

Step 7:
Open the CAMINO-101 by switching (7) to “ON”

***NOTE:** CAMINO-101 SUPPLIES ONLY 3.3V FOR GPS ANTENNA. WE RECOMMEND USING AMEC GPS ANTENNA (3.3V) WITH CAMINO-101. IF A 5V GPS ANTENNA IS CONNECTED TO CAMINO-101, IT MAY CAUSE DETERIORATION TO GPS RECEIVING PERFORMANCE.

III. Start-Up Setting

Step 1:
Connect the power cable to the power input and turn on CAMINO-101 by switching to “ON”. (1)

Step 2:
Check if the POWER indicator (2) is working properly.
Please refer to Section 3.1

Figure 2-2-3-4 Installation instruction

IV. Remarks

(1) Set up the GPS and VHF antennas in appropriate spots.
(Refer to Section 2.2)

(2) The required power voltage for CAMINO-101 is 12V / 24V DC. Use an adaptor if the supply voltage is not within the range.

⚠ **INCORRECT INPUT VOLTAGE WILL DAMAGE THE EQUIPMENT!**

2.2.3 Connector Pin Definition and Cable Wiring

2.2.3.1 Power Connector: Pin Definition and Cable Wiring

The power cable supplied has only a round connector at one end and there are two inner (red & black) wires. The wiring details are defined as follows:

Table 2-2-3-1 Power connector pin definition

Pin	Wire Color	Name	Function
1	-	-	-
2	Black	GND	Power Ground
3	Red	PWR	Positive (+); the input should be 12V / 24V DC

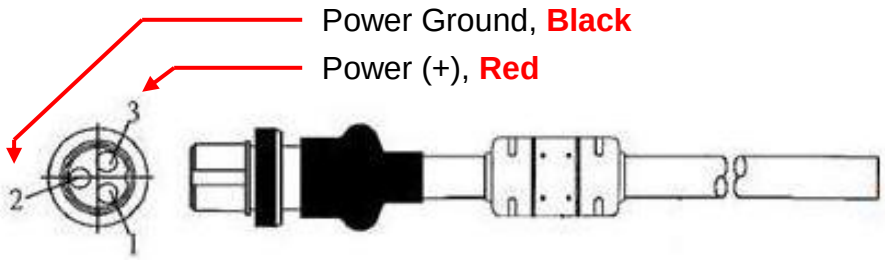


Figure 2-2-3-1 Wiring definition in Power Cable

2.2.3.2 NMEA 0183 Connector: Pin Definition and Cable Wiring

The NMEA 0183 cable supplied has only a round connector at one end and there are six inner wires. The wiring details of the NMEA cable are listed below.

Table 2-2-3-2 NMEA 0183 pin definition

Pin	Wire color	Name	Function
1	Brown	RXP	Positive(+); NMEA0183 Data input
2	Blue	RXN	Negative (−); NMEA0183 Data input
3	White	TXP	Positive(+); NMEA0183 Data output
4	Green	TXN	Negative (−); NMEA0183 Data output
5	/	/	/
6	Red	/	Reserved
7	Purple	/	Reserved
8	/	/	/

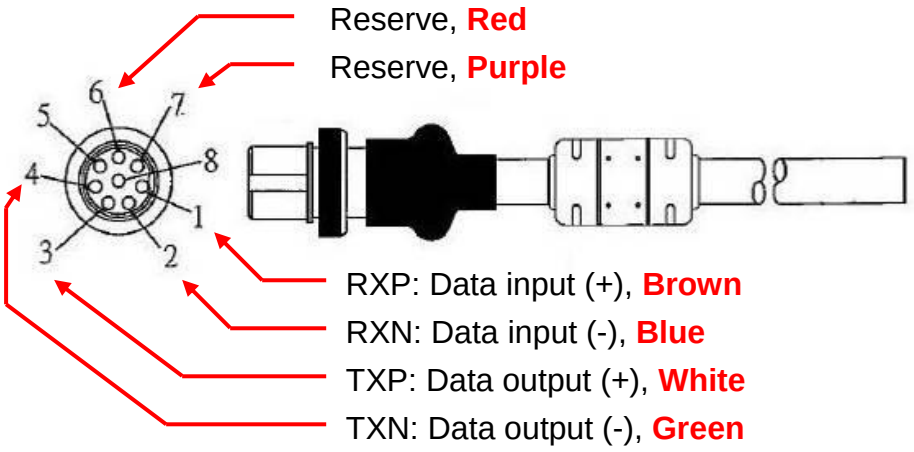


Figure 2-2-3-2 Wiring definition in NMEA 0183 cable

NMEA 0183 Connection Illustration

Refer to the illustration below when connecting to an external NMEA device via the onboard NMEA 0183 interface.

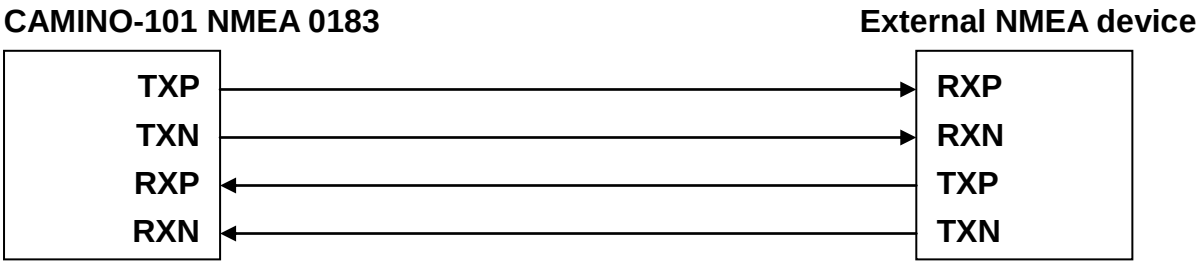


Figure 2-2-3-1 NMEA 0183 connection illustration

NOTE: **1. Please make sure the external device is fully NMEA 0183 compliant.**

2. The CAMINO-101 NMEA interface supports the following input sentences: RMC, GGA, GBS, GSA, and HDT.

2.2.3.3 RS-232 Connector: Pin Definition and Cable Wiring (CAMINO-101)

The RS-232 connector pins on CAMINO-101's rear panel are defined as follows:

Table 2-2-3-3 RS-232 connector pin definition

NO.	NAME	FUNCTION
1	/	/
2	RX	Receive Data
3	TX	Transmit Data
4	/	/
5	GND	Ground
6	/	/
7	/	/
8	/	/
9	/	/

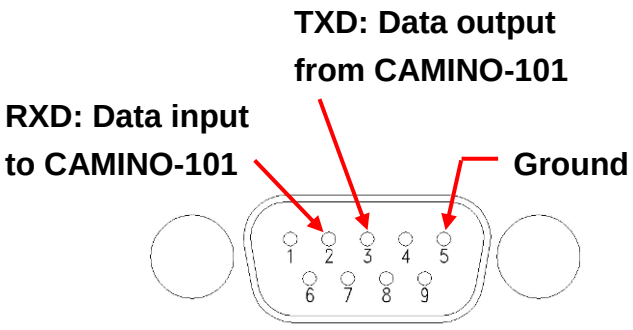


Figure 2-2-3-3
RS-232 Pin definitions, CAMINO-101

RS-232 Connection Illustration (CAMINO-101)

The RS-232 cable supplied with CAMINO-101 contains 9 different wires. However, only 3 wires are being used. This cable is a cross-over connection, not a straight thru connection. Refer to the following illustration when connecting to an external RS-232 device.

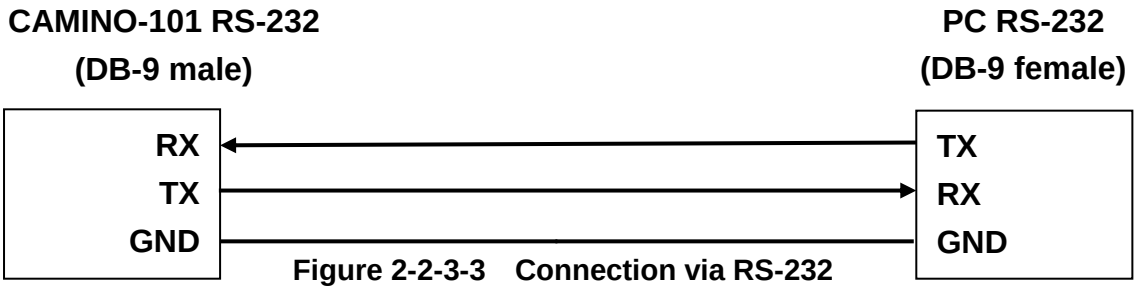


Figure 2-2-3-3 Connection via RS-232

2.2.3.4 RS-232 Connector: Pin Definition and Cable Wiring (CAMINO-101A & CAMINO-101W)

CAMINO-101A and CAMINO-101W models' RS-232 connector pin assignments on are different than on CAMINO-101 model's.

On CAMINO-101A and CAMINO-101W, there are additional pin assignments at the RS-232 connector specifically for connecting to an optional external Tx-off Switch Box. See also Tx-Off Switch Box User Guide.

Table 2-2-3-4 RS-232 connector pin definitions

NO.	NAME	FUNCTION
1	/	/
2	RX	Receive Data
3	TX	Transmit Data
4	GND	I/O Ground
5	GND	RS-232 Ground
6	/	Tx-Off
7	/	Tx-Off LED
8	GND	RS-232 Ground
9	GND	I/O Ground

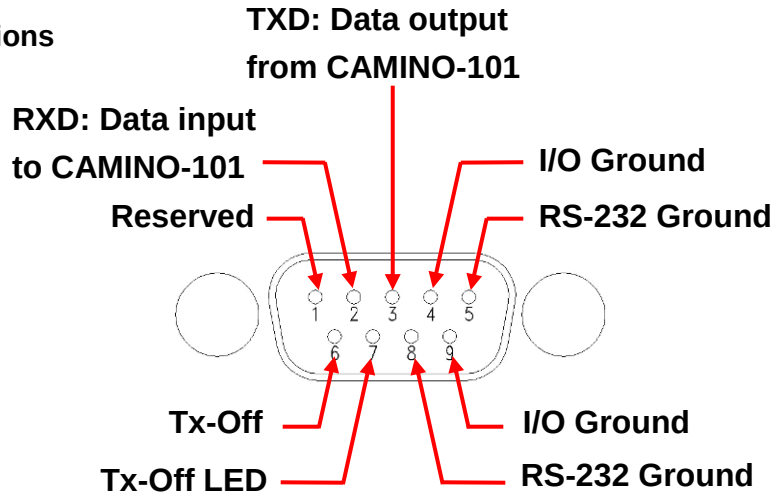


Figure 2-2-3-4
RS-232 Pin definitions, CAMINO-101A / W

RS-232 Connection Illustration (CAMINO-101A & CAMINO-101W)

The RS-232 cable supplied with CAMINO-101A & CAMINO-101W consists of 3 wires dedicated for RS-232 connection. (Please note: the 9-wires-RS232-cable used in CAMINO-101 cannot be used for these two CAMINO-101A/W models.) This connection is cross-over and not straight thru. Refer to the following illustration when connecting to an external RS-232 device.

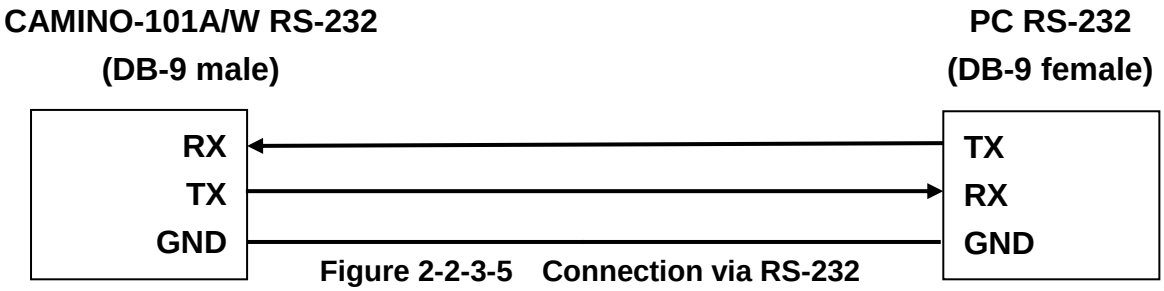


Figure 2-2-3-5 Connection via RS-232

2.2.4 VHF Antenna Installation

The quality and positioning of the antenna are the most important factors dictating AIS performance. It is recommended that a VHF antenna with omni directional vertical polarization be specifically tuned for AIS operation band. Since the range of VHF signals is largely decided by line of sight distance, the VHF antenna should be placed as high as possible and at least 5 meters away from any constructions made of conductive materials. It is recommended to keep the VHF antenna at least 3 meters away from the CAMINO-101 unit.

To avoid interference, the VHF antenna location should be placed accordingly as on Figure 2-2-4.

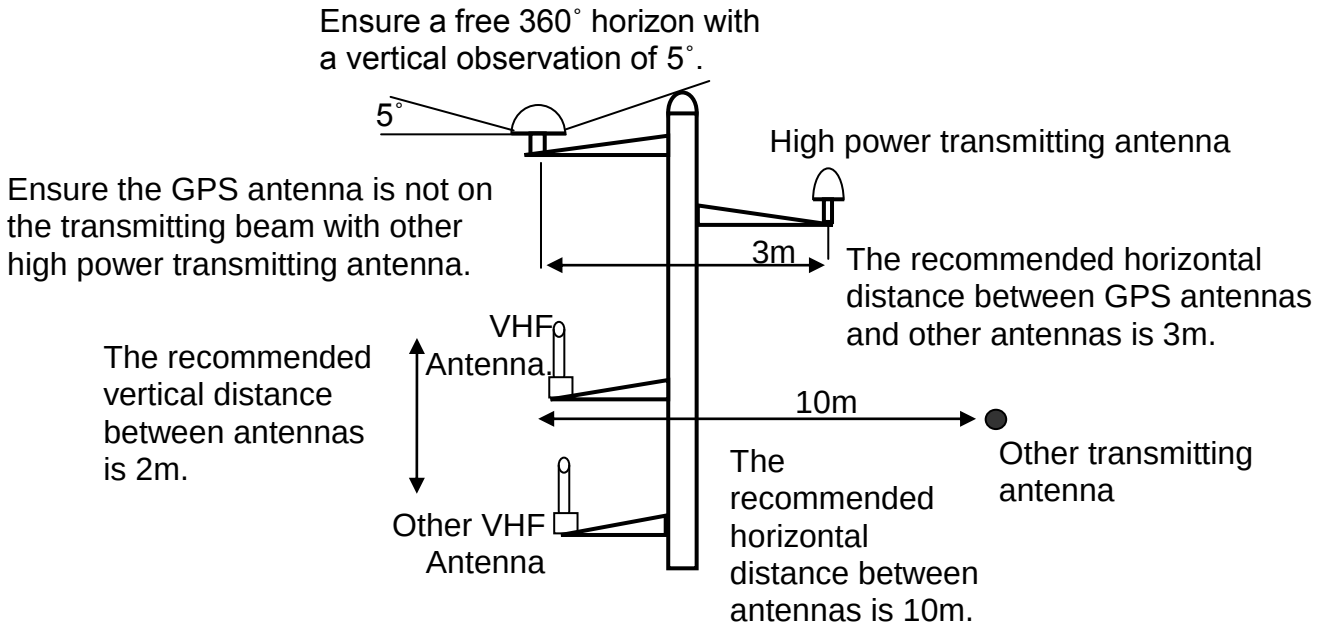


Figure 2-2-4 VHF/GPS Antenna Locations

We recommend choosing AMEC AIS VHF antenna. To save space, you can also select a VHF/GPS combo antenna provided by AMEC.

2.2.5 GPS Antenna Installation

The GPS antenna must be installed where it has a clear view of the sky, so that it may access the horizon freely with 360° degrees, with a vertical observation of 5 to 90 degrees above the horizon as illustrated in Figure 2-2-4.

GPS ANTENNA LOCATION

Enter the GPS antenna location data in “SHIP SETTING” after the installation Following is the GPS antenna location offsets.

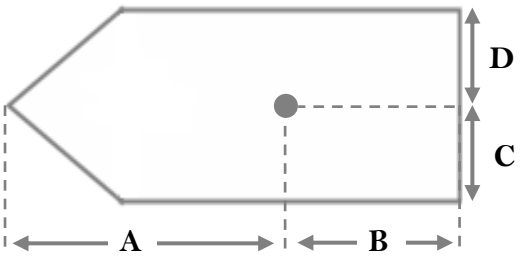


Figure 2-2-5 GPS Antenna location

We recommend choosing AMEC AIS GPS antenna. To save space, you can also select a VHF/GPS combo antenna provided by AMEC.

2.2.6 Antenna Cabling

When connecting the cable(s) with the CAMINO-101, take note of the following precautions.

1. Do not bend the cable(s).
2. Each coaxial cable should be set up separately and can only be set up in a single cable tube.
3. Each coaxial cable should keep a 10m safe distance with the power cable.
4. Connecting port of the coaxial cable should be insulated.

2.2.7 CAMINO-101 External Connections

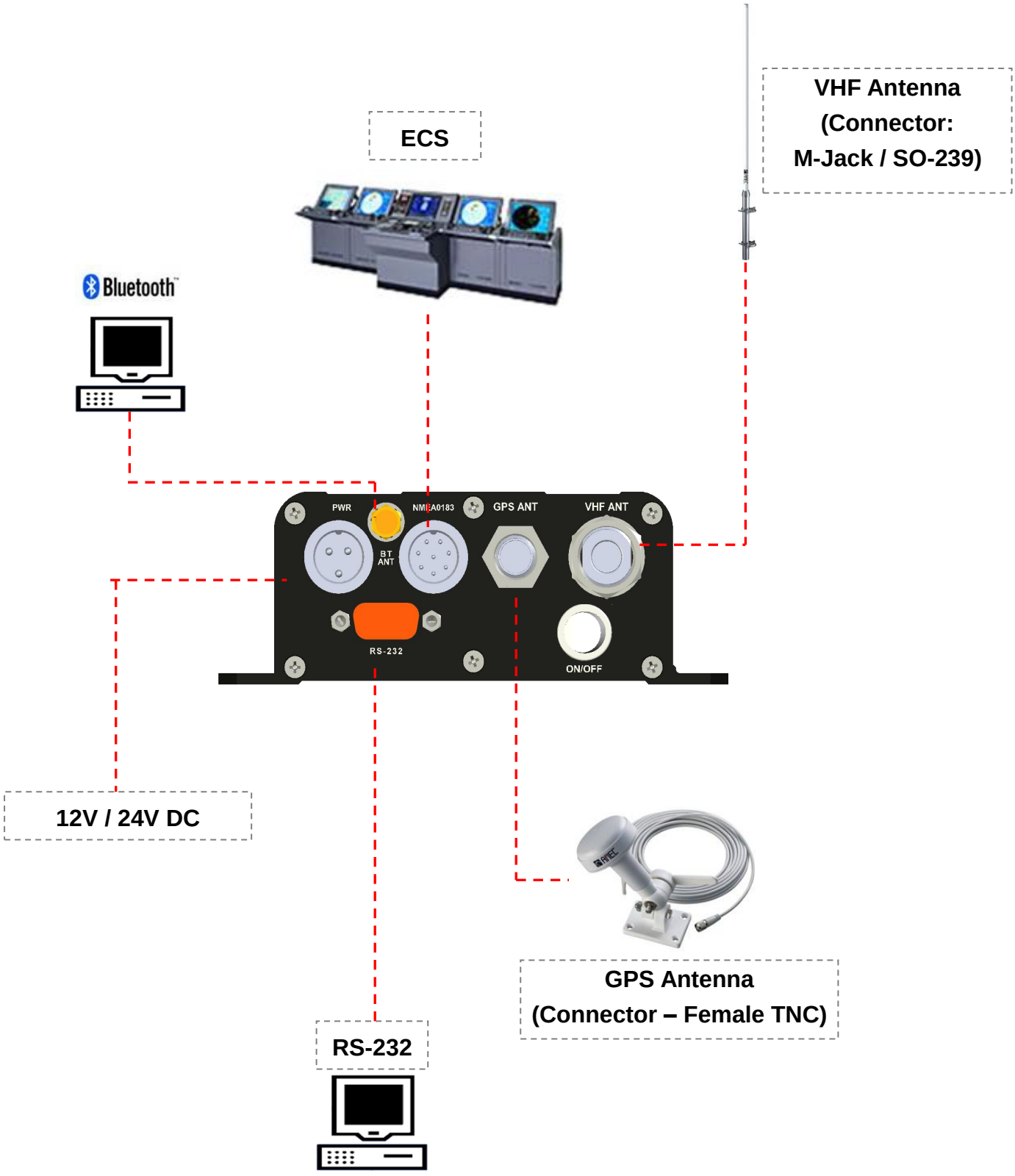


Figure 2-2-7 External configurations

2.2.8 AMEC AIS Configuration Software Installation

This program enables users to set up own ship's dynamic, static, and voyage related information through computer.

Please find the AMEC AIS Configuration program in the CD supplied and follow the installation instructions below.

Step 1: Please open the AMEC AIS Configuration file and click on the setup icon AMEC AIS Configuration.exe to start the installation process.

Step 2: Please click on Next > to continue.

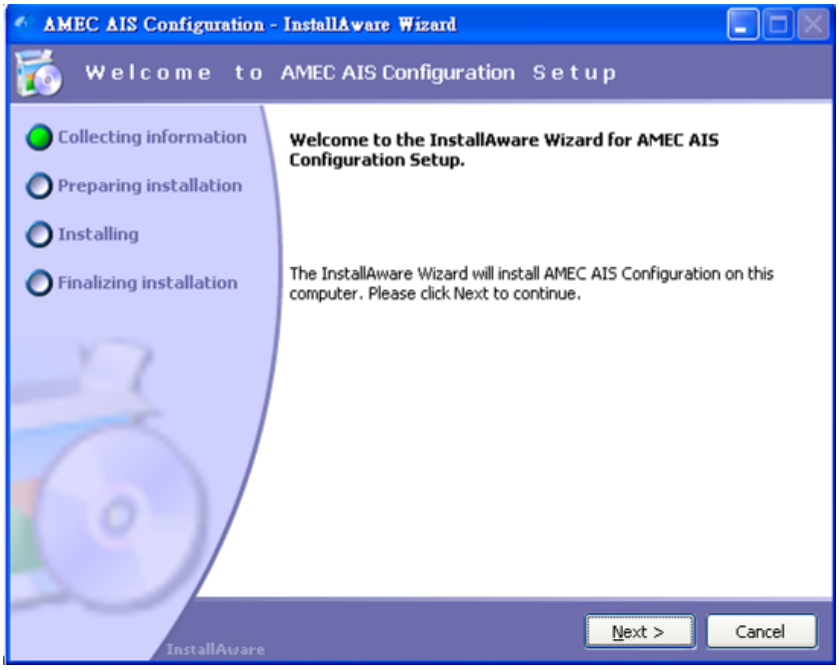

AMEC AIS Configuration - InstallAware Wizard
Welcome to AMEC AIS Configuration Setup
Collecting information
Preparing installation
Installing
Finalizing installation
Welcome to the InstallAware Wizard for AMEC AIS Configuration Setup.
The InstallAware Wizard will install AMEC AIS Configuration on this computer. Please click Next to continue.
InstallAware
Next >
Cancel

Figure 2-2-8-1 Setup Configuration

Step 3: Please read and accept the license agreement before clicking on Next > to continue.

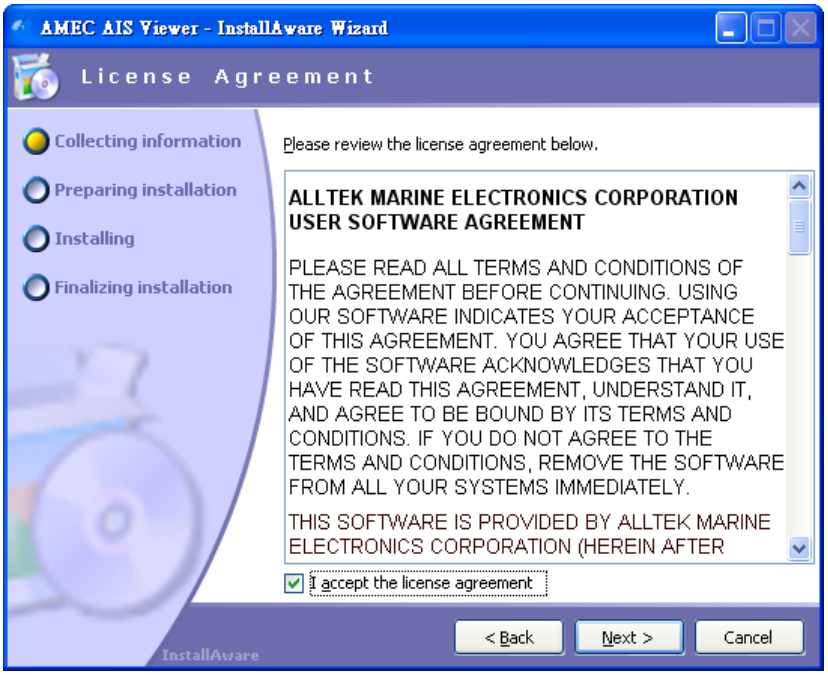

AMEC AIS Viewer - InstallAware Wizard
License Agreement
Collecting information
Preparing installation
Installing
Finalizing installation
Please review the license agreement below.
ALLTEK MARINE ELECTRONICS CORPORATION
USER SOFTWARE AGREEMENT
PLEASE READ ALL TERMS AND CONDITIONS OF THE AGREEMENT BEFORE CONTINUING. USING OUR SOFTWARE INDICATES YOUR ACCEPTANCE OF THIS AGREEMENT. YOU AGREE THAT YOUR USE OF THE SOFTWARE ACKNOWLEDGES THAT YOU HAVE READ THIS AGREEMENT, UNDERSTAND IT, AND AGREE TO BE BOUND BY ITS TERMS AND CONDITIONS. IF YOU DO NOT AGREE TO THE TERMS AND CONDITIONS, REMOVE THE SOFTWARE FROM ALL YOUR SYSTEMS IMMEDIATELY.
THIS SOFTWARE IS PROVIDED BY ALLTEK MARINE ELECTRONICS CORPORATION (HEREIN AFTER
I accept the license agreement
InstallAware
< Back
Next >
Cancel

Figure 2-2-8-2 Set up Configuration

Step 4: Please fill in the required information and click on Next > to continue.

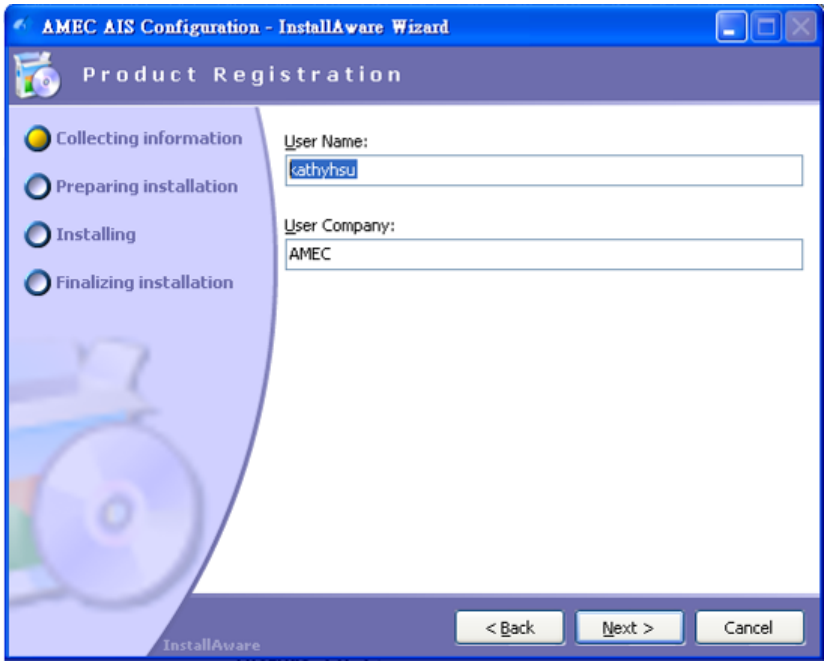


Figure 2-2-8-3 Set up Configuration

Step 5: Select the destination folder and click on Next > to continue.

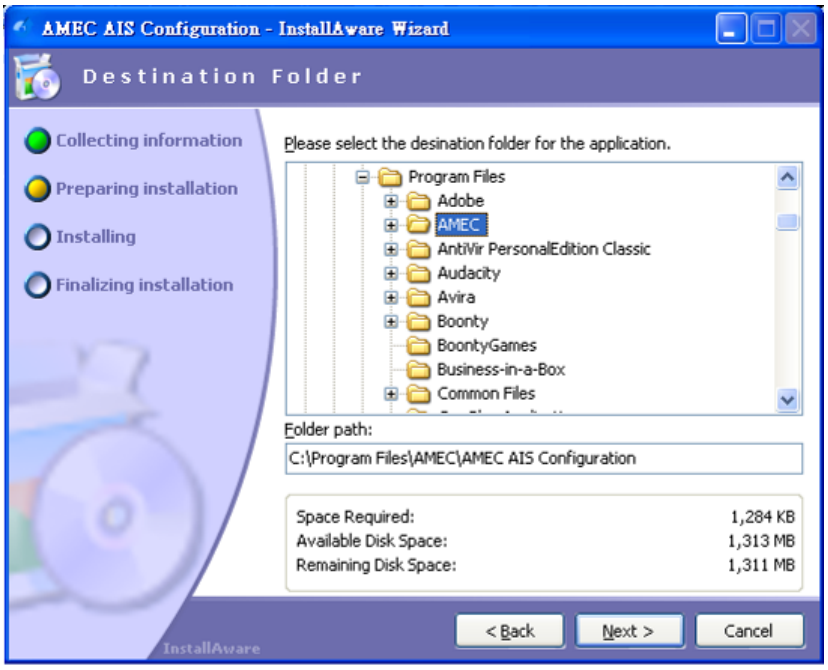


Figure 2-2-8-4 Set up Configuration

Step 6: Select the Start Menu group for the application and choose users for the program and click on Next > to continue.

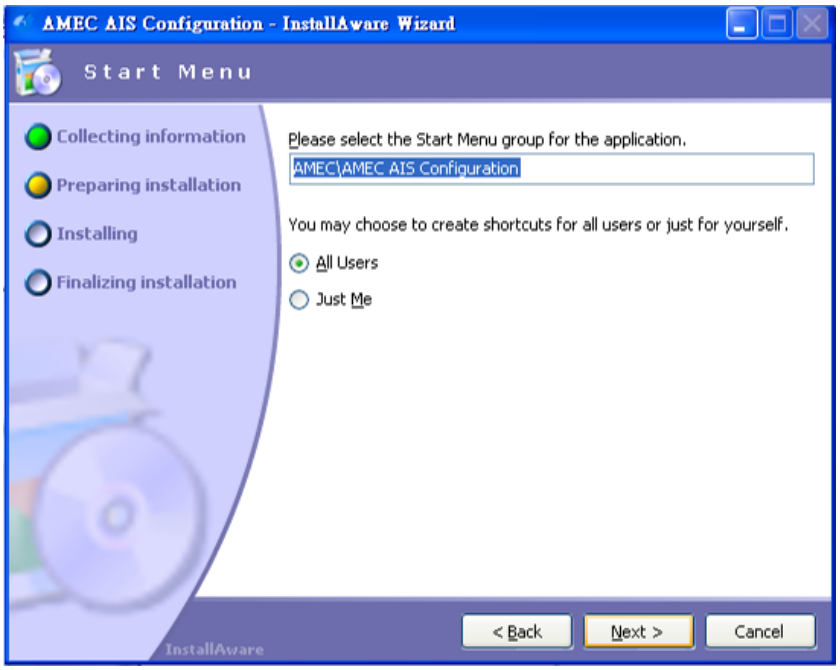


Figure 2-2-8-5 Set up Configuration

Step 7: The installation will start immediately, please wait for a short moment.

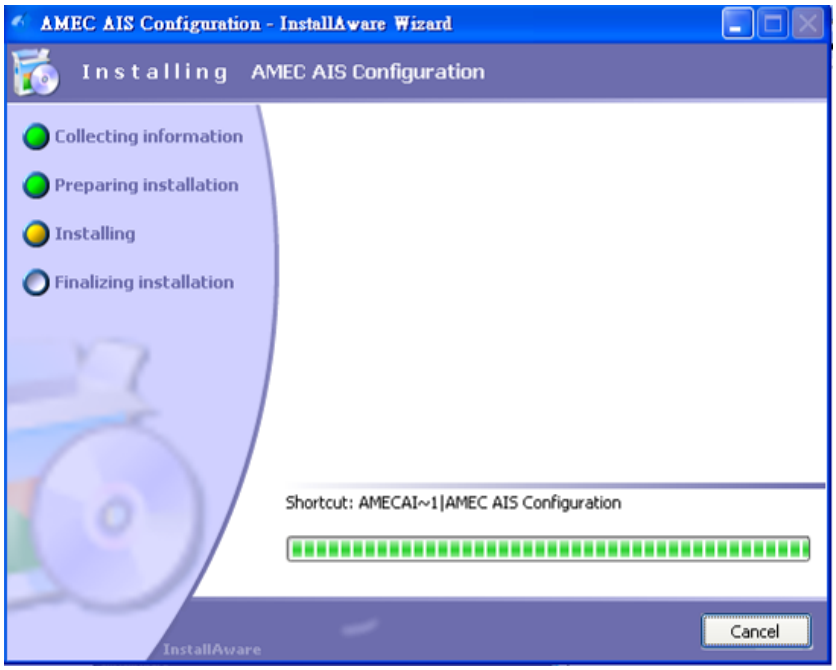


Figure 2-2-8-6 Set up Configuration

Step 8: Please click on Finish > to finish the installation. Check the checkbox to start AMEC AIS Configuration after the installation.

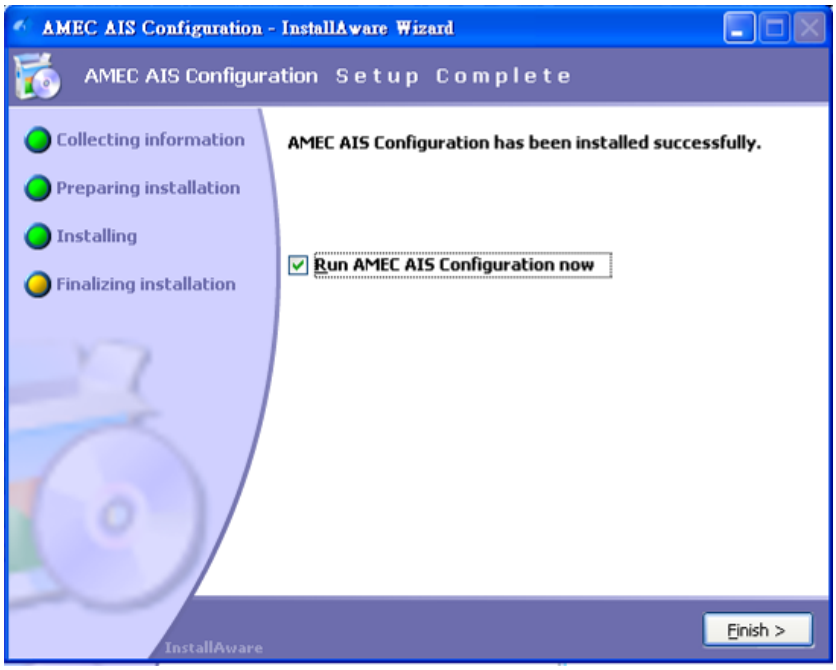


Figure 2-2-8-7 Set up Configuration

2.3 AMEC AIS Viewer Software Installation

The Viewer program enables users to view AIS information on computers; users may browse the relative positions of surrounding vessels and the dynamic and static information regulated by IMO. For professional users or further details, we suggest connecting AMEC CAMINO-101 with other marine electronic products such as ECS or Radar to achieve better performances.

Please find the AMEC AIS Viewer program in the CD supplied and follow the installation instructions below.

Step 1: Put the program disk into your computer, and double click on AMEC AIS Viewer.exe .

Step 2: A welcome window will pop out. Please click Next > **to continue.**

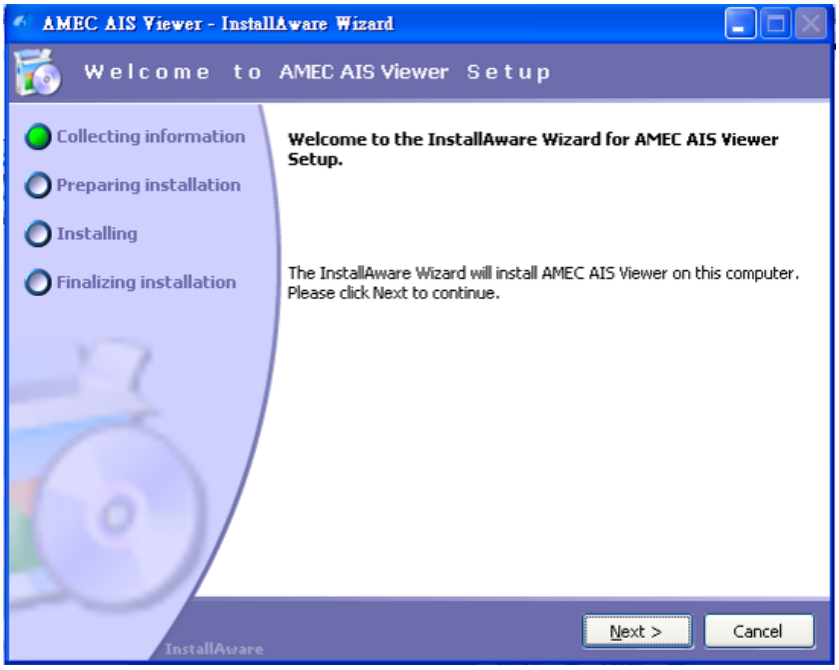
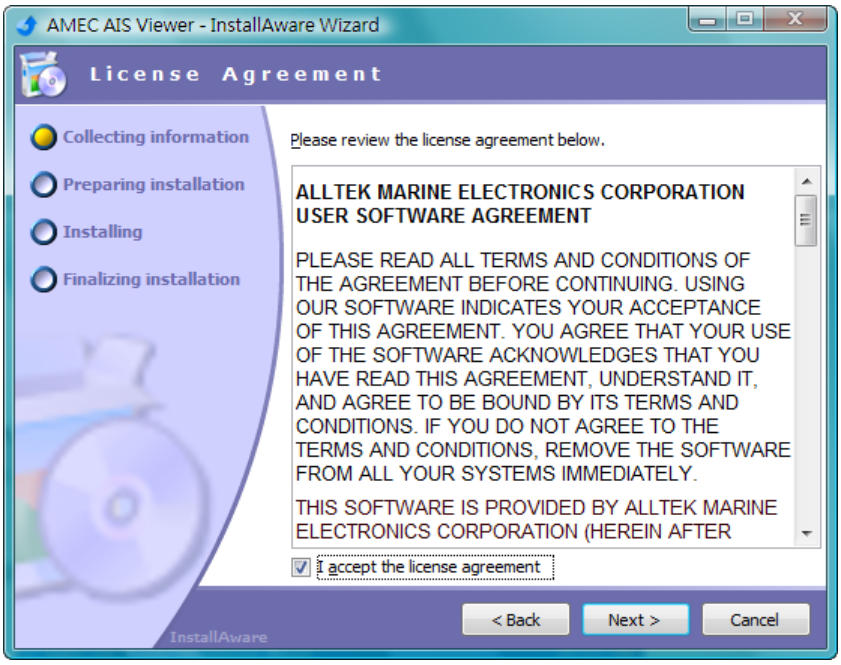

AMEC AIS Viewer - InstallAware Wizard
Welcome to AMEC AIS Viewer Setup
Collecting information
Preparing installation
Installing
Finalizing installation
Welcome to the InstallAware Wizard for AMEC AIS Viewer Setup.
The InstallAware Wizard will install AMEC AIS Viewer on this computer. Please click Next to continue.
InstallAware
Next >
Cancel

Figure 2-3-1 Set up Viewer

Step 3: Please read and accept the license agreement before clicking on Next > to continue.


AMEC AIS Viewer - InstallAware Wizard
License Agreement
Collecting information
Preparing installation
Installing
Finalizing installation
Please review the license agreement below.
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USER SOFTWARE AGREEMENT
PLEASE READ ALL TERMS AND CONDITIONS OF THE AGREEMENT BEFORE CONTINUING. USING OUR SOFTWARE INDICATES YOUR ACCEPTANCE OF THIS AGREEMENT. YOU AGREE THAT YOUR USE OF THE SOFTWARE ACKNOWLEDGES THAT YOU HAVE READ THIS AGREEMENT, UNDERSTAND IT, AND AGREE TO BE BOUND BY ITS TERMS AND CONDITIONS. IF YOU DO NOT AGREE TO THE TERMS AND CONDITIONS, REMOVE THE SOFTWARE FROM ALL YOUR SYSTEMS IMMEDIATELY.
THIS SOFTWARE IS PROVIDED BY ALLTEK MARINE ELECTRONICS CORPORATION (HEREIN AFTER
I accept the license agreement
InstallAware
< Back
Next >
Cancel

Figure 2-3-2 Set up Viewer

Step 4: Please fill in the required information and click on Next > to continue.

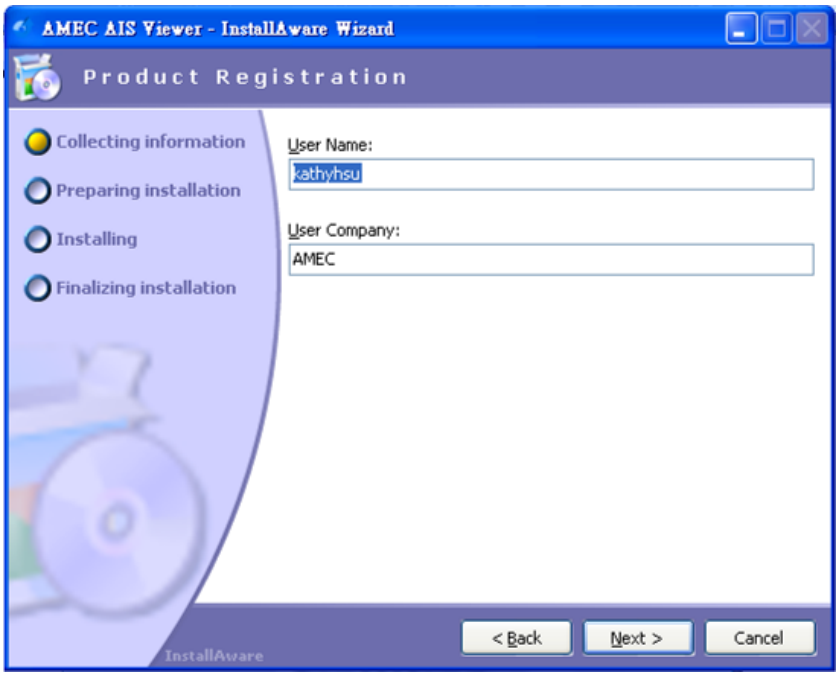


Figure 2-3-3 Set up Viewer

Step 5: Please choose a folder to install and then click on Next > to continue.

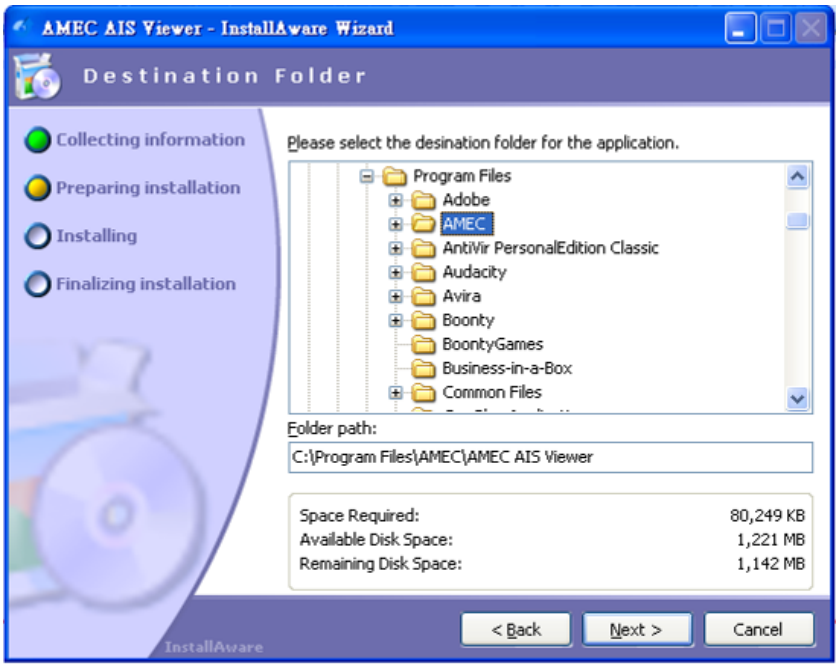


Figure 2-3-4 Set up Viewer

Step 6: Select the Start Menu group for the application and choose All Users for the program and click on Next > to continue.

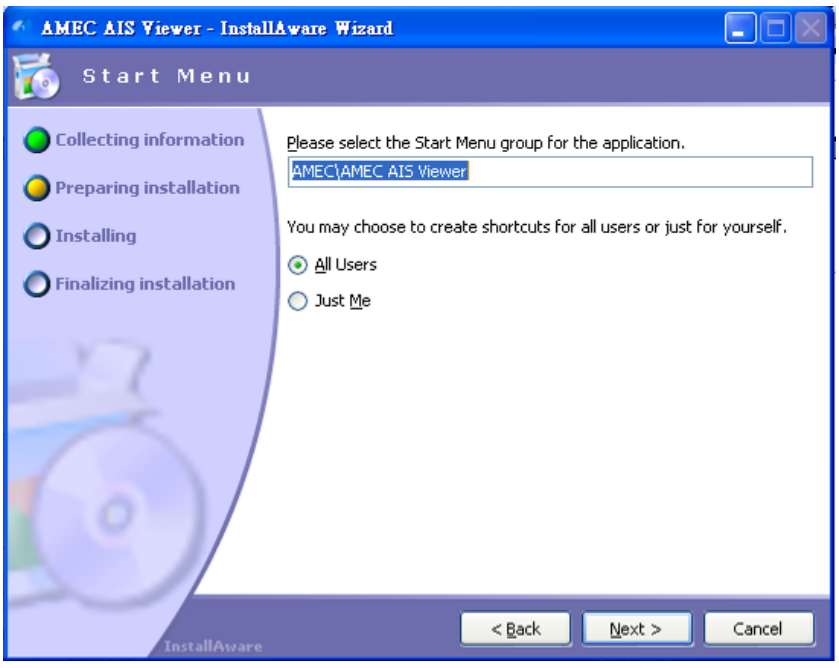


Figure 2-3-5 Set up Viewer

Step 7: The installation will start immediately, please wait a short moment.

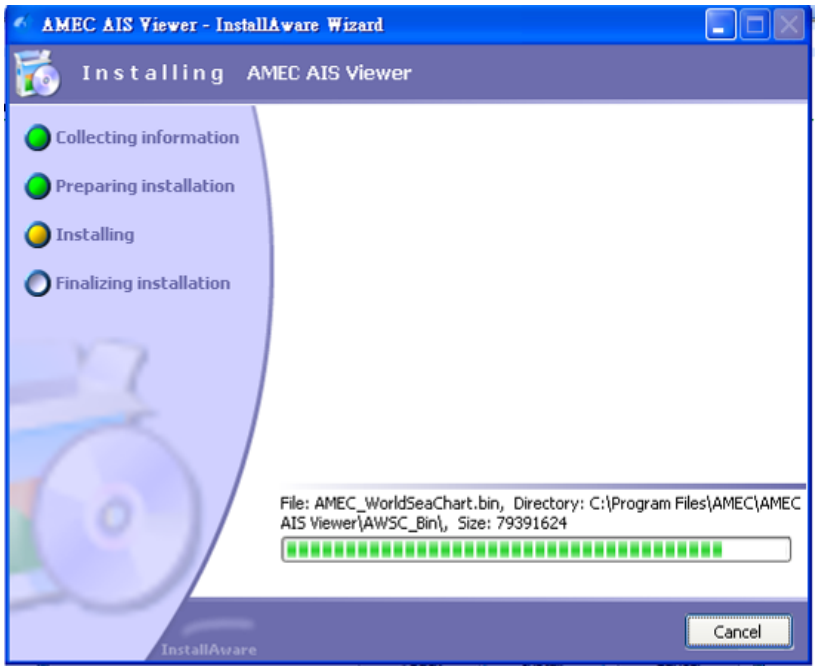


Figure 2-3-6 Set up Viewer

Step 8: When the installation is completed, please click on Finish > to complete the installation. With checkbox checked, it continues to run the AMEC AIS Viewer program.

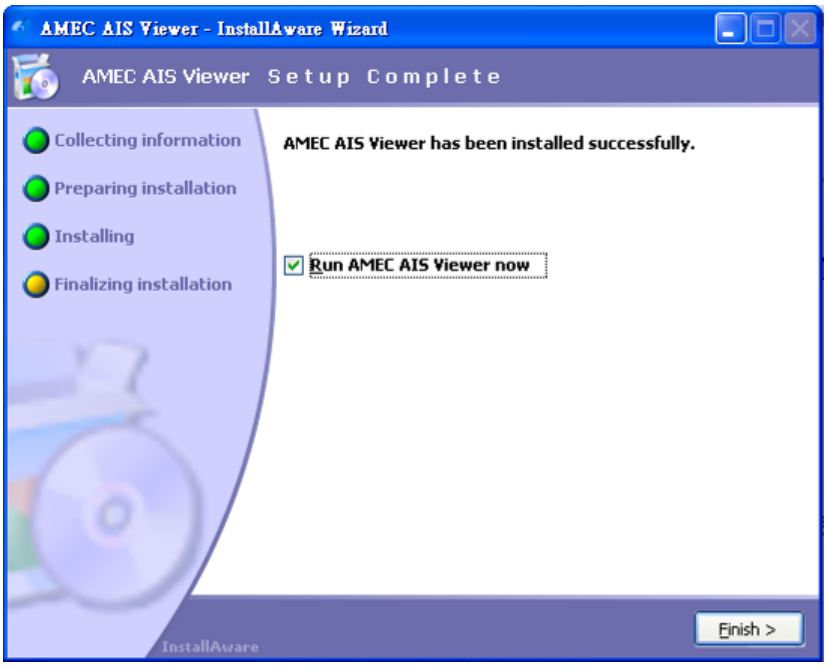


Figure 2-3-7 Set up Viewer

2.4 Bluetooth Pairing (Optional Feature) (CAMINO-101W only)

For CAMINO-101W with Bluetooth, please consult the manual of your Bluetooth device for pairing procedure. AMEC's default password (passkey) is "0000".

3 GET STARTED

3.1 Turning Power ON / OFF

TURNING POWER ON:

Step 1: Check the input voltage. CAMINO-101 input voltage is 12V / 24V DC.

Step 2: Connect the CAMINO-101 with power input.

Step 3: Switch the power to “ON”.

Step 4: The power status indicator will turn to steady green light from flashing.

Step 5: When the power status indicator turns to steady green, the unit is in operation. The indicator of the receiving channel flashes once in a short interval whenever an AIS signal goes through.

TURNING POWER OFF:

Step 1: Switch the power to “OFF”.

Step 2: The unit shuts down and the power status indicator turns off.

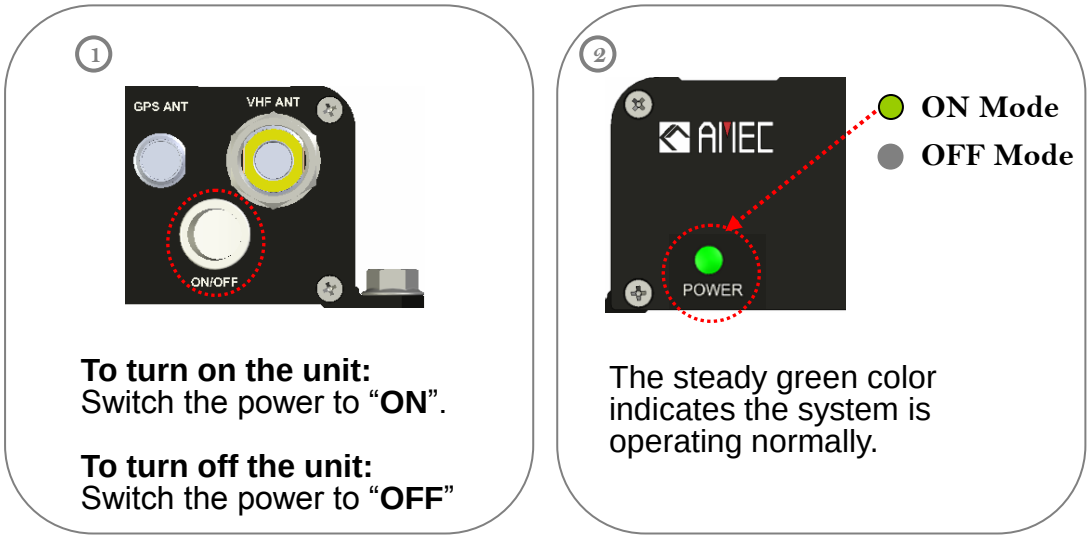


Figure 3-1 Description of Power Switch & Indication

3.2 Front Panel LED Indicators

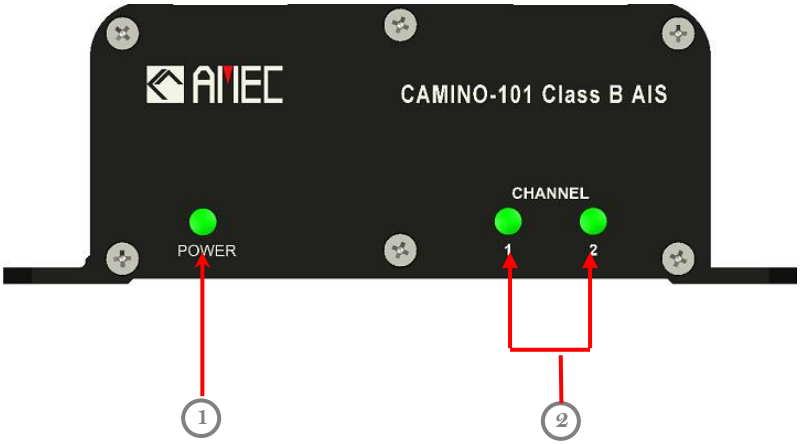


Figure 3-2 LED indicators on front panel

Table 3-2-1 Brief description of LED indicators

LED INDICATORS			
Power LED			**Description**
	Green	Steady	Device in normal operation
		Blinking	Initialization
	Orange	Steady	MMSI not set / silent mode (TX off)
		Flash	Transmission timeout
	Red	Steady	Power error / system failure
		Blinking	GPS not fixed over 30 minutes
Channel 1 / 2 LED			**Description**
	Green	Flash	Receiving AIS data
S	Orange	Flash	Transmitting AIS data

Table 3-2-2 Power LED Indicator in detail

POWER LED INDICATOR			
LED Color		**Indication**	**Description**
Green	Steady	Normal	Device in normal operation
	Flash	Initialization	System initialization and checking
Orange	Steady	Silent mode	(1) MMSI is not yet programmed into the device, such that the device cannot enter into transmit mode, it can only be in “receive mode”. (2) The device is turned into Tx-Off mode (Silent mode) by setting in AMEC AIS Viewer or by using Tx-Off Switch Box. (Section 4.3.2.5)
	Flash	TX timeout	(1) Quiet time command imposed by harbor authorities (2) Transmission ceased due to carrier-sensing of high VDL load
Red	Steady	Power error	Power system is in failure
	Flash	BIIT alarm	An abnormal condition of the device is detected during BIIT (Built In Integrity Test)

Table 3-2-3 Channel LED Indicators in detail

CHANNEL LED INDICATOR		
Channel	**Status**	**Indication**
1	Flash Green	Incoming data receiving on Channel 1.
2	Flash Green	Incoming data receiving on Channel 2.
1	Flash Orange	Transmitting data on Channel 1
2	Flash Orange	Transmitting data on Channel 2

3.2.1 Built-in Integrity Test (BIIT)

With BIIT (Built in Integrity Test) function, the CAMINO-101 is constantly monitoring and testing the integrity of the AIS transceiver. Should an abnormal condition be detected within the device, the Power LED will alert with flashing red light. Abnormal conditions may include situations like the followings:

- GPS is unable to gain lock after 30 minutes of losing GPS track
- Background noise level exceeds allowable threshold (-77dBm)

3.3 CAMINO-101 Configuration Settings

To configure CAMINO-101, use the AMEC AIS Configuration software in the provided CD-ROM. The software has both configuration and diagnostic functions. Beware that MMSI setting is mandatory for CAMINO-101's operation.

3.3.1 Configuration Settings

The following steps (step 1 ~ 4) describe the details of configuration settings:

Step 1: Serial Port and Baud Rate Setting

(1) Select auto or manual for serial port number and its baud rate setting.

- **Auto:** The system will identify and show the serial port number and baud rate automatically.
- **Manual:** Select appropriate serial port number and baud rate manually. If the desired serial port number cannot be found under the list, manually key in the serial port number.

(2) Click on **"Connect"** to connect to the desired serial port and baud rate.

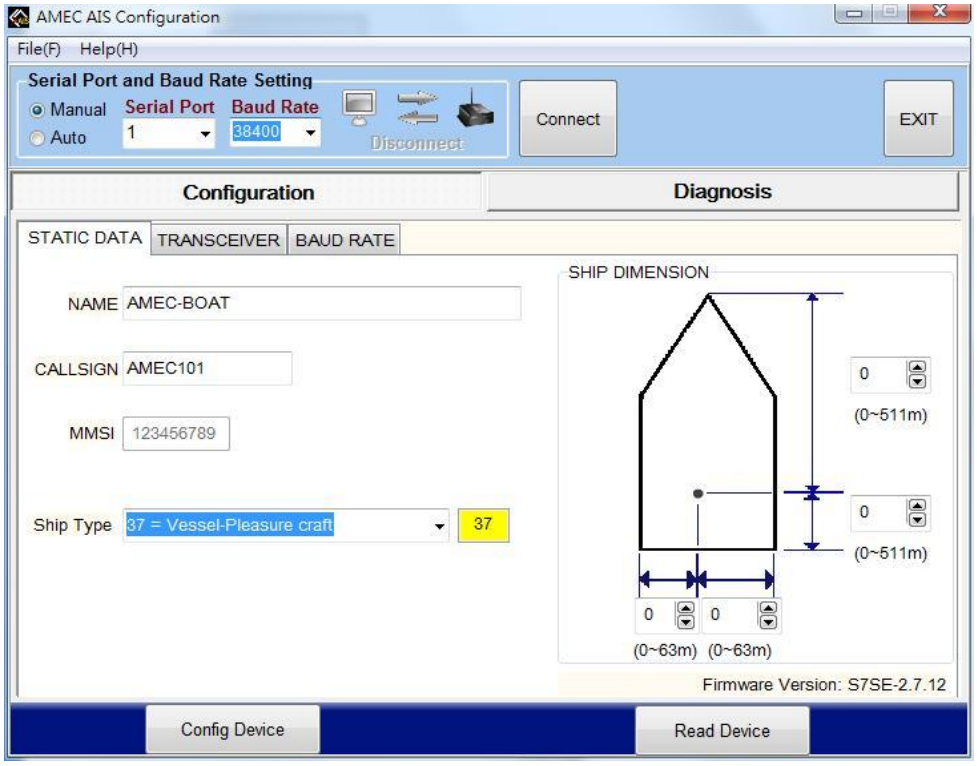


Figure 3-3-1-1 Serial Com Port and Baud Rate Setting

Step 2: Static Data Setting

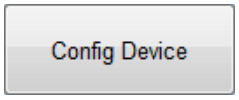
(1) Click on "STATIC DATA" tab.

(2) Enter your NAME, CALL SIGN, MMSI, and select the Ship Type.

- NAME: Limited to 20 characters only.
- CALL SIGN: Limited to 7 characters only.
- MMSI: Enter your MMSI (Maritime Mobile Service Identity) number.
- Ship Type: Choose your ship type.

! WARNING: MMSI can only be entered once, please be sure entering the correct MMSI.

(3) Fill in the dimension of your own ship at “SHIP DIMENSION”.

(4) Click on 

to confirm and complete the setting.

(5) To perform other setting, click on another tab to go further.

(6) Firmware version can be checked in the lower right corner of the window.

(7) To leave from the AMEC AIS Configuration software, click on “EXIT”.

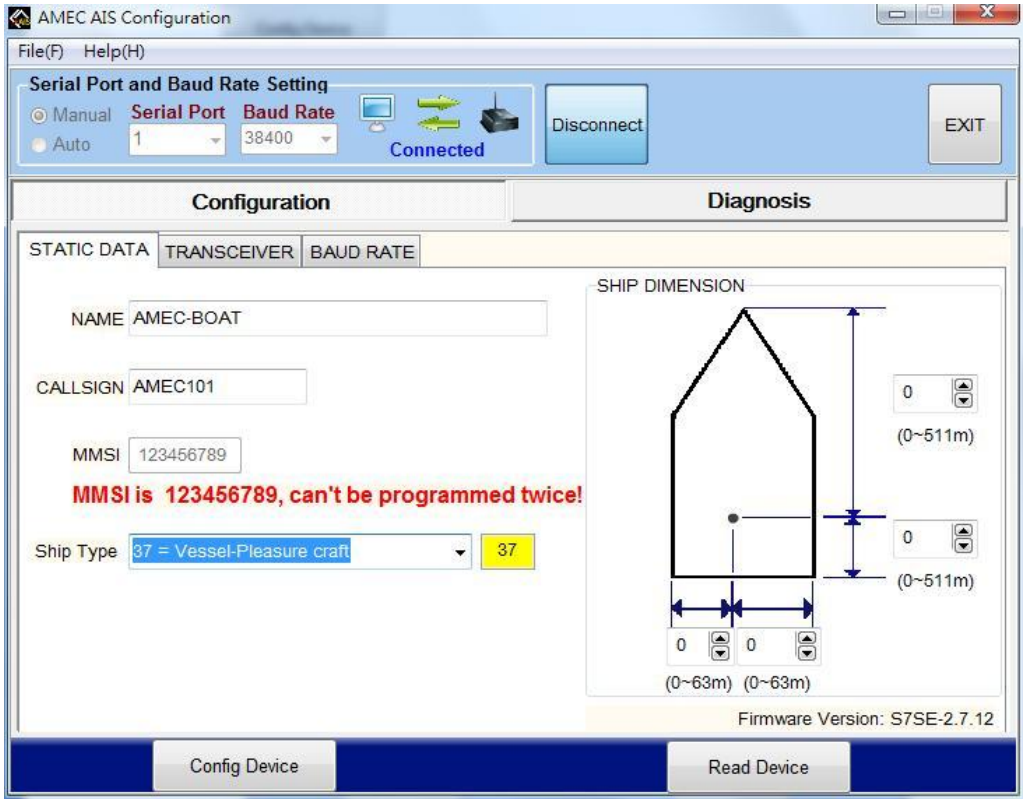


Figure 3-3-1-2 Static Data Setting

FOR USERS IN THE UNITED STATES OF AMERICA ONLY

WARNING: The entry of static data into this device shall be performed by the vendor of the device or by an appropriately qualified person in the business of installing marine communications equipment on board vessels.

FOR USERS IN THE UNITED STATES OF AMERICA ONLY

WARNING: It is a violation of the rules of the Federal Communications Commission to input an MMSI that has not been properly assigned to the end user, or to otherwise input any inaccurate data in this device.

Step 3: Transceiver Setting

(1) To disable DSC monitoring function, select the “OFF” button. The default setting is “ON” (DSC enabled).

(2) To disable the GPS output, check and select the “OFF” button. The default setting is “ON” (GPS enabled).

(3) Click on

to confirm and complete the setting.

(4) To perform other settings, click on another tab to go further.

(5) To leave the AMEC AIS Configuration software, click on “EXIT”.

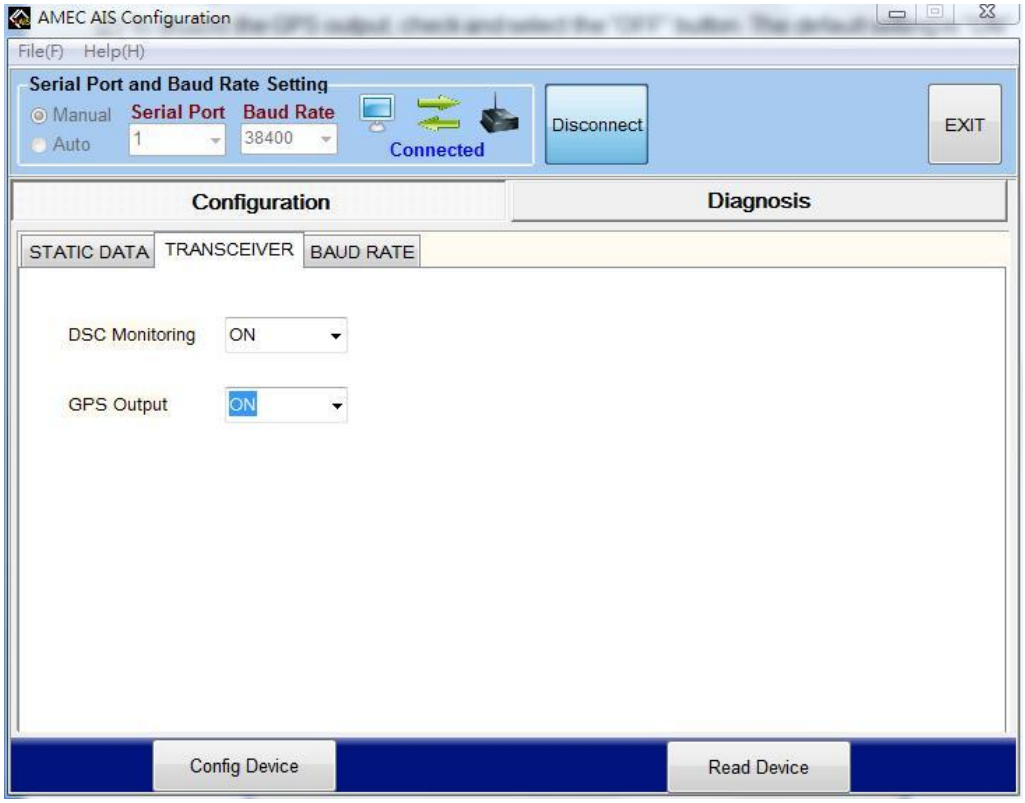


Figure 3-3-1-3 Transceiver Setting

Step 4: Baud Rate Setting

(1) Click on “BAUD RATE” tab.

(2) The default baud rate for RS-232 is 38,400, enter your desired baud rate if necessary*.

(3) The default baud rate for NMEA is 38,400, enter your desired baud rate if necessary**.

(4) Click on

to confirm and complete the setting.

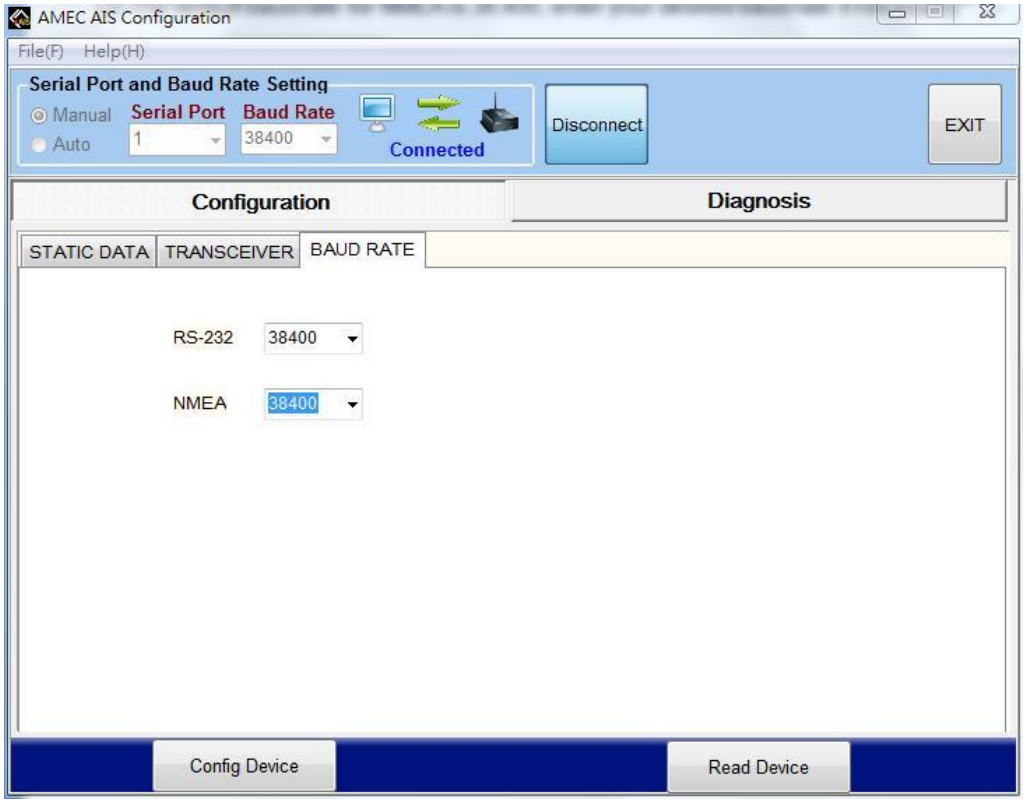
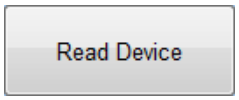


Figure 3-3-1-4 Baud Rate Setting

***NOTE:** **For RS-232, CAMINO-101 supports six baud rates:**
115200, 57600, 38400, 19200, 9600, 4800

****NOTE:** **For NMEA 0183, CAMINO-101 supports two baud rates:**
38400, 4800

(5) To perform other settings, click on another tab to go further.

(6) To read the device information, click on 

. A Configuration Report will pop-up in NotePad or an application that is associated for text file format.

(7) To leave from the AMEC AIS Configuration software, click on “EXIT”.

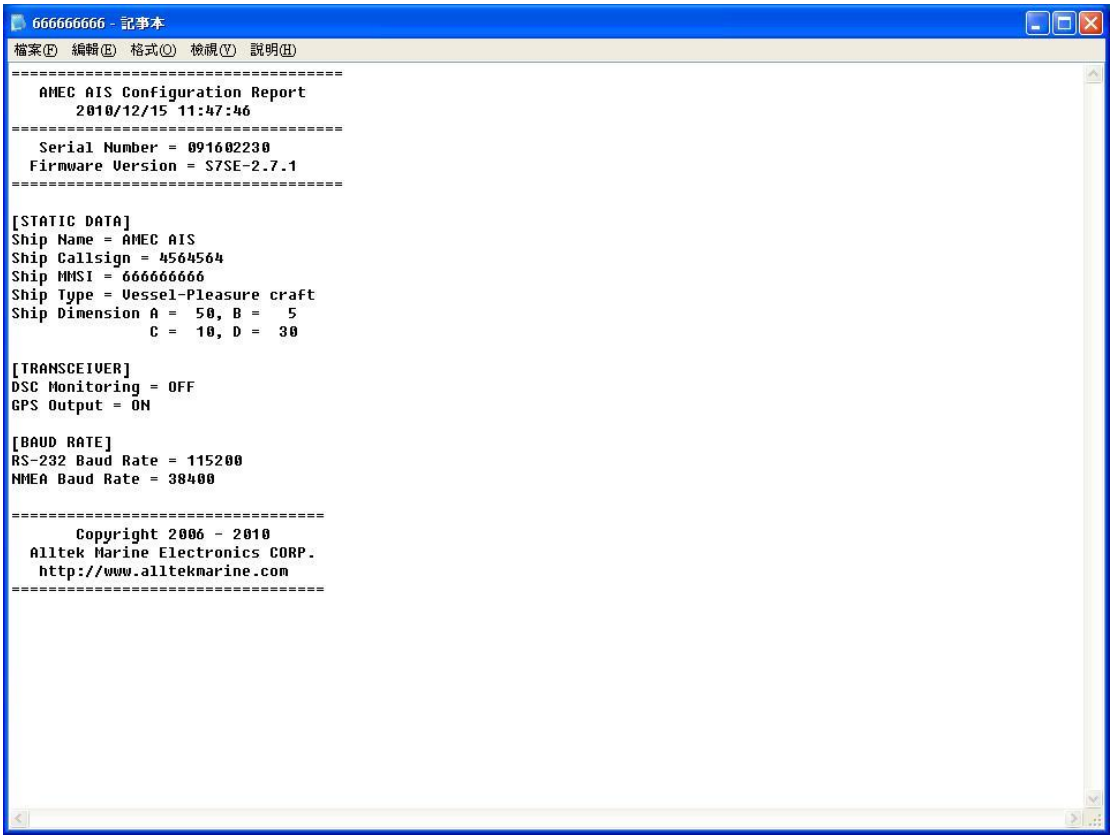


Figure 3-3-1-5 Configuration Report

3.3.2 Diagnosis Functions

The second part of the AMEC AIS Configuration software utility features diagnosis functions. This function should be performed only after the device and antennas are all fully installed. Click on the Diagnosis tab to proceed for System Check, GPS Status, and Data Log.

System Check

The SYSTEM CHECK function can be used to check the Firmware Version, Serial Number, MMSI, GPS status, AIS TX report count, and AIS RX report count of the device. This function started upon the connection of the device when powered on.

To recheck all status, click on

button.

Figure 3-3-2-1 shows the status of the device when initially connected.

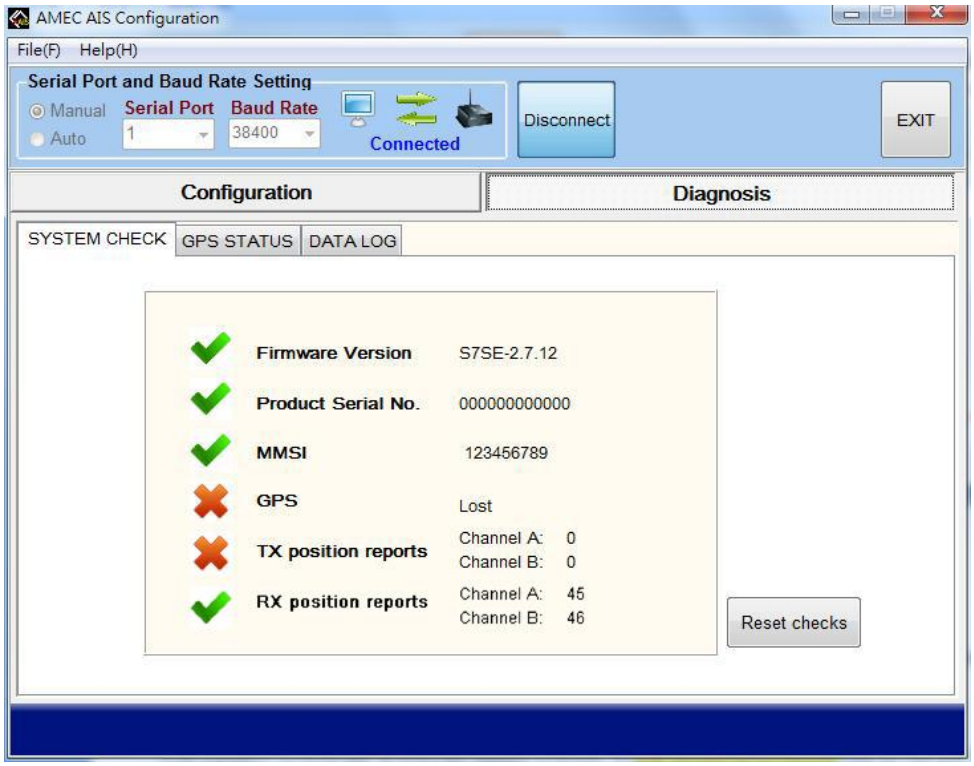


Figure 3-3-2-1 System Check

Figure 3-3-2-2 shows the status of the device after 5 to 10 minutes if all the installation is well-completed and it is transmitting / receiving normally.

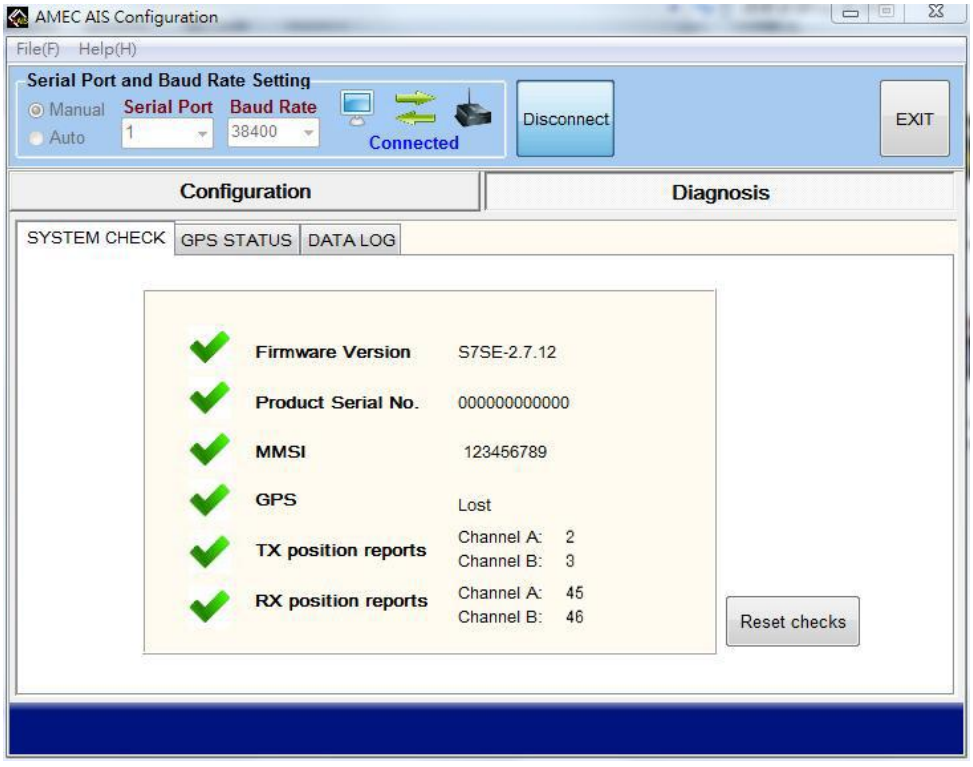


Figure 3-3-2-2 System Check

GPS Status:

This tab shows the GPS status and the connectivities of all GPS satellites being used.

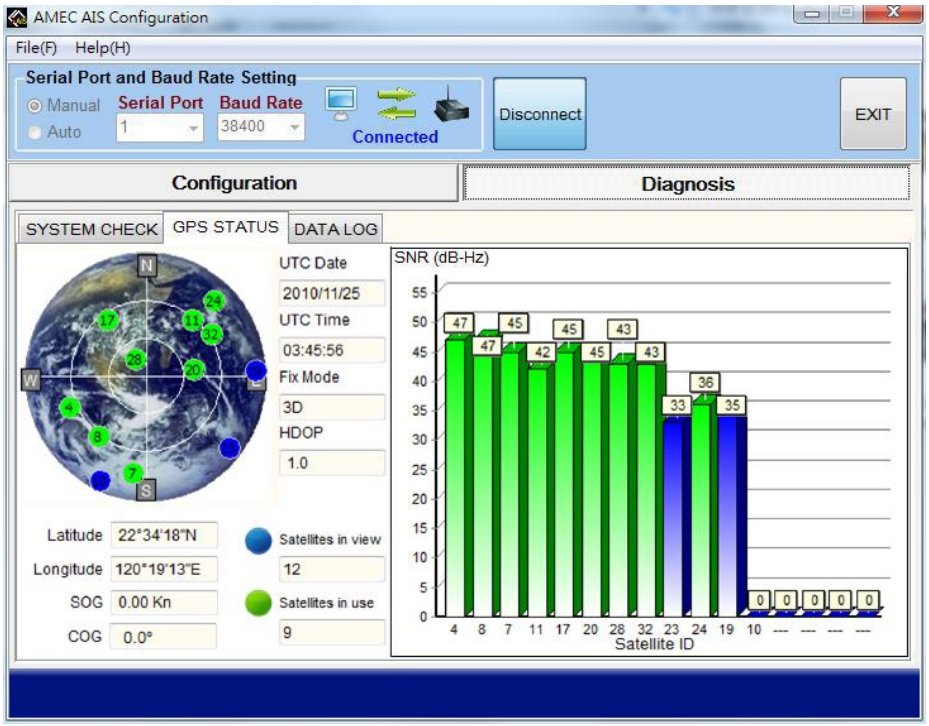


Figure 3-3-2-3 GPS Status

Data Log:

The log shows the collected AIS data log from the device. You may save or clear the current collected log.

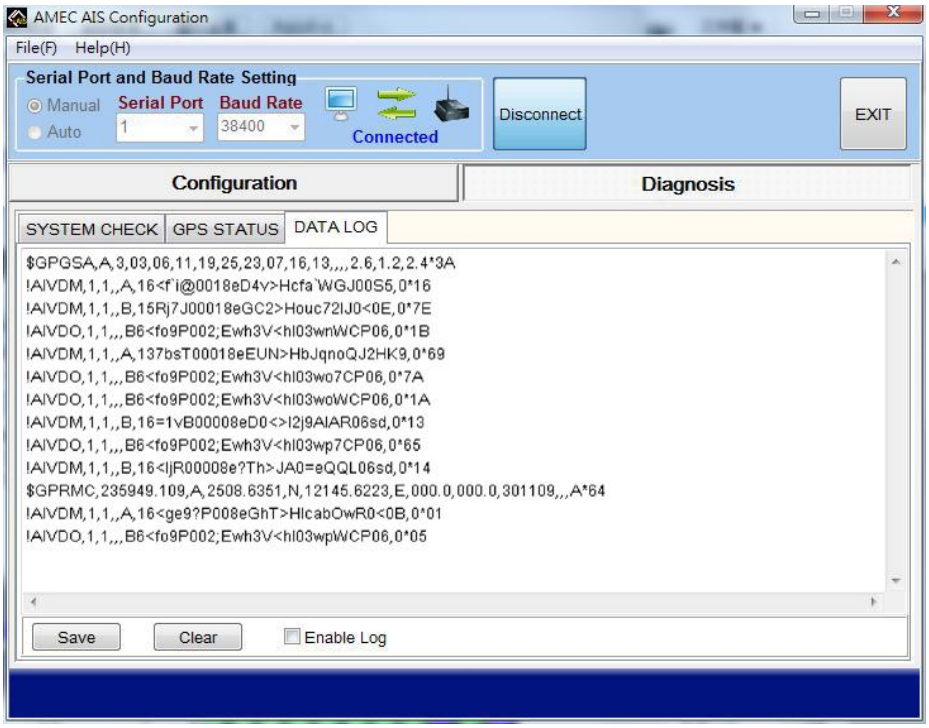


Figure 3-3-2-4 Data Log

4 AMEC AIS VIEWER DESCRIPTION

4.1 RS-232 Serial Port Selection

To inspect if the serial port is correctly selected, please follow the steps below.

1. Use RS-232 port to connect with PC and AMEC AIS transponder when desired*.

***NOTE: CAMINO-101 can also be connected to the USB ports of PC/Laptop through RS-232/USB converter (not included in the accessory kit; purchase separately). Please install the USB driver before connecting to the USB ports.**

■ **Windows 7 or VISTA version:**

Click on "Start" → Select "Control Panel" → Select "Device Manager" → Click Port (COM&LPT)

■ **Windows XP version:**

Click on "Start" → Select "My Computer" → Click "Control Panel" → Select "System" → Choose "Hardware" → Select "Device Manager" → Click Port (COM&LPT)

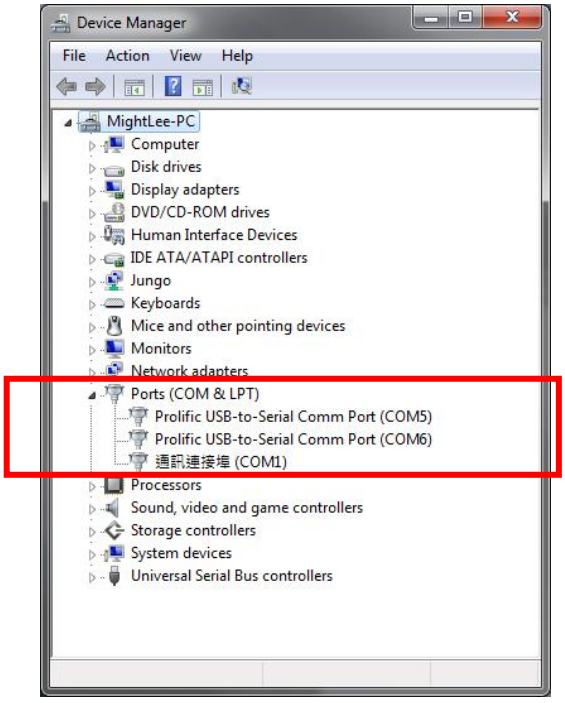


Figure 4-1 Serial Port setting

2. Back to the AIS Viewer Program, please select **"Connection"** tab and click **"Connect AIS"**. Please select the suitable serial port number in the pop out window.

4.2 Running AMEC AIS Viewer

By following the steps below, user may start the AIS Viewer shortly after finishing the installation:

Step 1: Click on the AMEC AIS Viewer program.

Please select Manual or Auto for serial port and baud rate configuration setting. Click on

to connect with the desired serial port and baud rate. (Refer to Figure 4-2-1).

- **Auto:** the system will identify and show the serial port number and baud rate automatically.
- **Manual:** select appropriate serial port and baud rate manually. If the desired serial port cannot be found under the list, manually key in the serial port number.

AMEC AIS Viewer
Quick Start
1. Before connecting the serial port, please ensure that the device is connected to your computer and turned on.
2. Select appropriate serial port and baud rate, then click the connect button to start the device connection.
Notice: When the desired serial port is not in the serial port drop down menu in the manual mode. We suggest inputting the port number in the drop down menu manually to begin connecting.
Manual
Auto
Serial Port
1
Baud Rate
38400
Disconnect
Connect
AIS
Close

Figure 4-2-1 Run AMEC AIS Viewer

You may also click on **"Close"** to start the Viewer program and connect with the desired serial port and baud rate afterwards.

1. Go to "**Connection**" → "**Connect AIS**" to set the serial port and baud rate (Figure 4-2-2). Please refer to **Section 4.3.2.4 "Connect AIS"** for the details.

2. If additional information is required from another GPS, please go to "**Connection**" → "**Connect GPS Receiver**" to set the serial port and baud rate for GPS receiver (Figure 4-2-2). Please refer to **Section 4.3.2.4 "Connect GPS Receiver"** for the details.

3. You may also click on "**Connection**" → "**Device Wizard**" to connect AIS with the AIS Viewer.

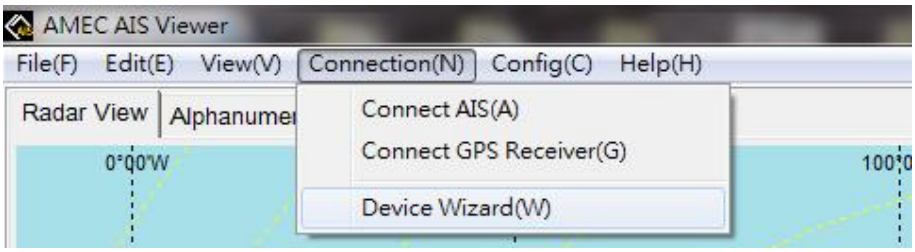


Figure 4-2-2 Run AMEC AIS Viewer

Step 2: Go to "**Config**" → **"CPA/TCPA"** to set the threshold value of CPA and TCPA* (Figure 4-2-3). Please refer to **Section 4.3.2.5 "CPA/TCPA"** for the details.

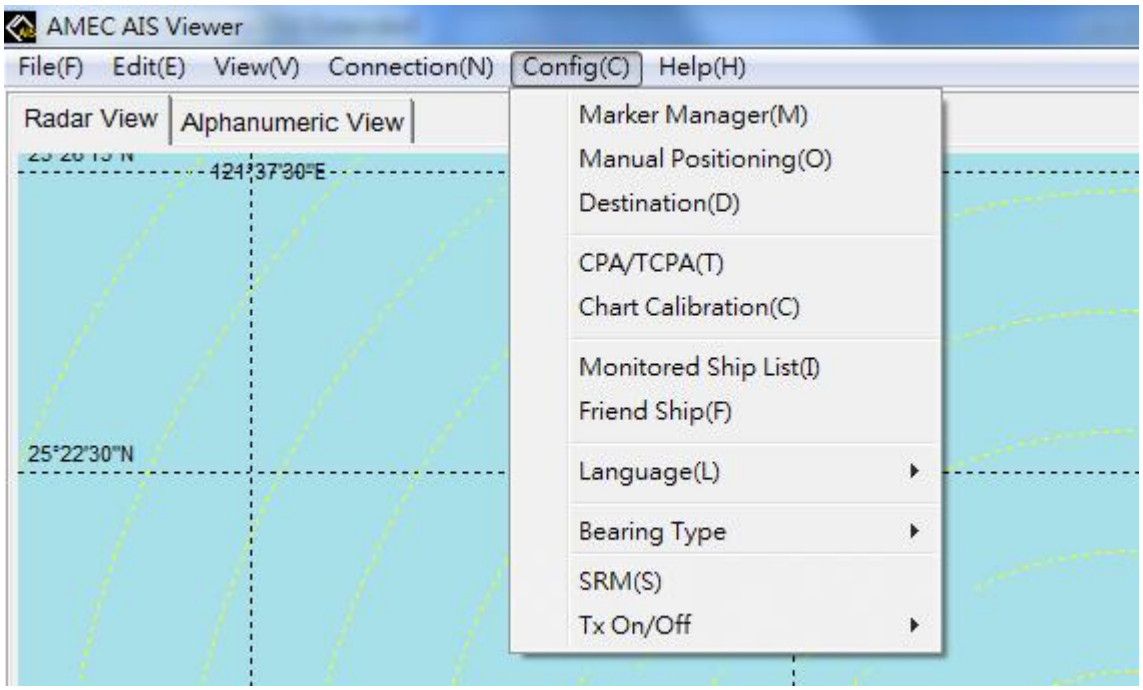


Figure 4-2-3 Run AMEC AIS Viewer

***NOTE:** **(1) This function would be invalid without GPS data input.**

(2) The CAMINO-101 and AMEC AIS Viewer software are NOT equipped with audible alarm. User may set up CPA/TCPA audible alarm through other maritime equipment such as Chartplotter, Radar Plotter, etc.

After completing the steps above, you may start using the AIS Viewer.

4.3 Display Indications

Below (Figure 4-3) is the main screen of the Viewer. By functionalities, the screen is divided into 5 areas and each presents certain information. Please see the details as follow.

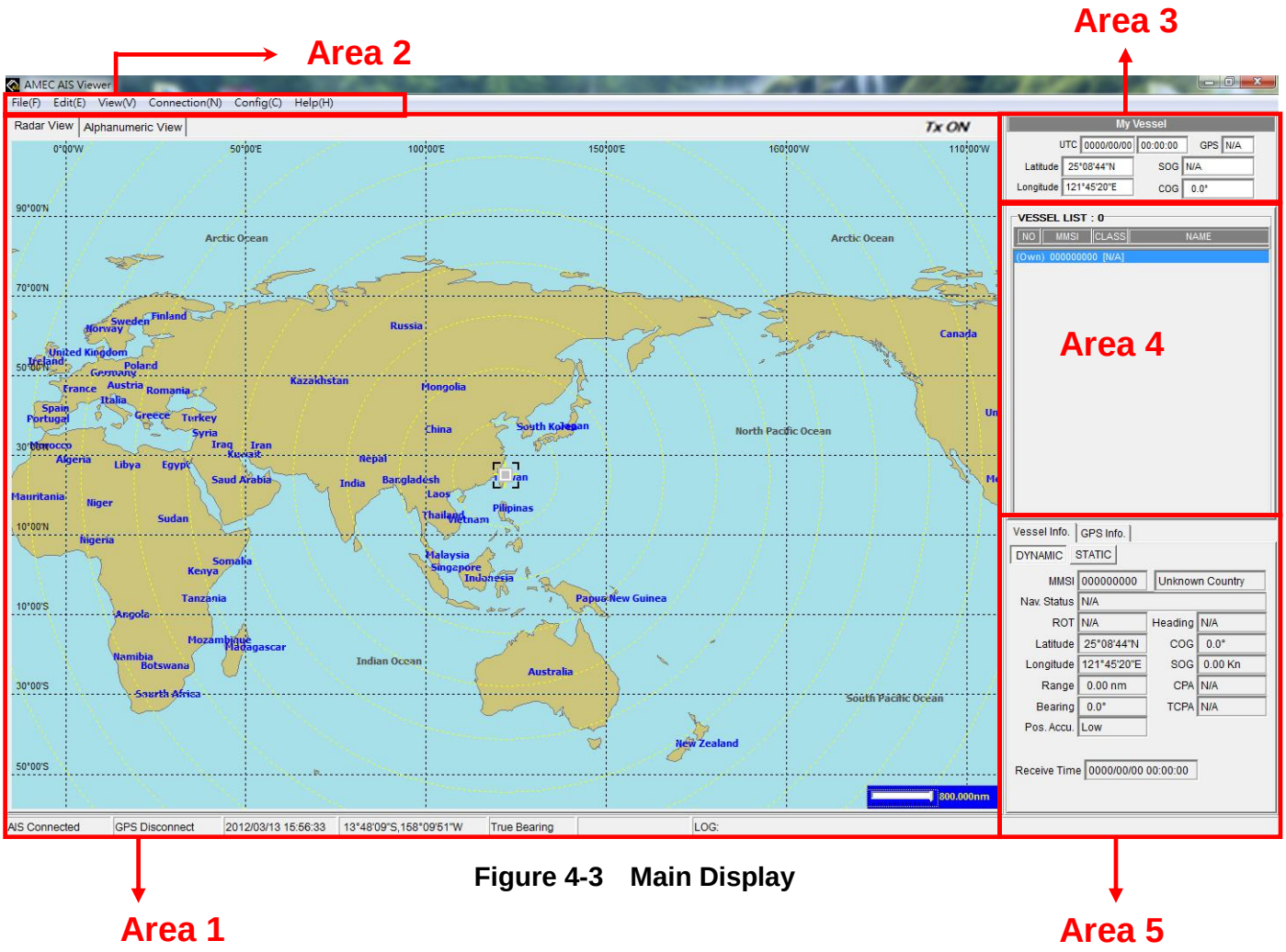


Figure 4-3 Main Display

4.3.1 Area 1: Screen View

There are 2 viewing modes, radar view and alphanumeric view.

4.3.1.1 Radar View

The AIS targets are displayed on your PC screen in the form as shown below. Under this viewing mode, all targets will be displayed on the Radar display. (Figure 4-3-1-1)

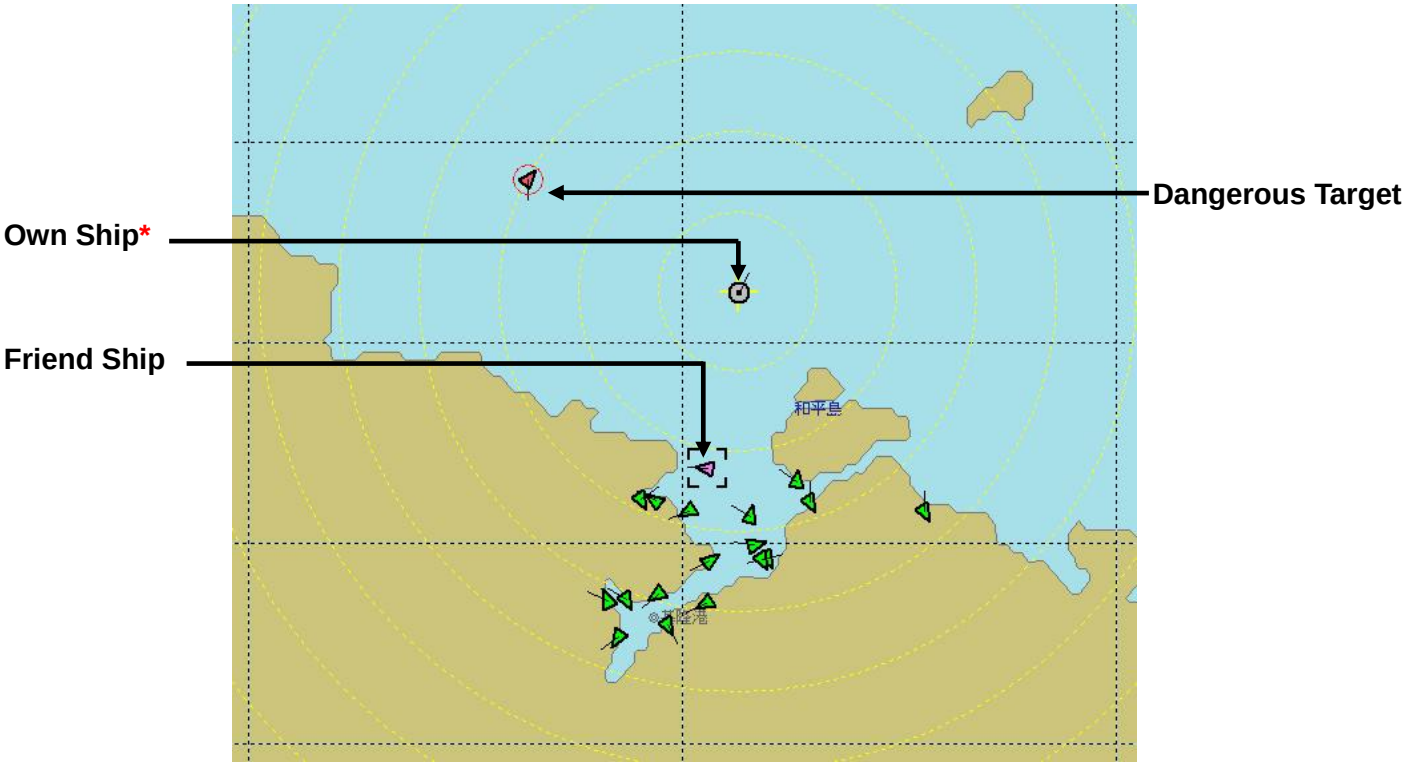


Figure 4-3-1-1 Main Display

On the Radar View shown above, some characteristics of the AIS targets are as described below,

- Each AIS ship is in the shape of a triangle.
- Under normal GPS reception, own ship is located in the center of the radar view.
- When there is no GPS reception, you can manual reset own ship's longitude and latitude or the Viewer will calculate the relative position of the own ship based on the information from the received targets.
- A maximum number of 500 AIS targets can be displayed on the radar plotter at a time.
- The straight line extended from AIS target represents the course of the ship.
- Under the situation of NO GPS data input, double click at any position on the Radar display to make it the center on the screen. Please refer to **Section 4.3.2.3 "Center View"** to have your own ship as the center.

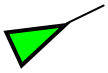
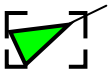
***NOTE: Own ship position will be fixed at the center of the Radar display WITH GPS data input.**

- Please use the scale bar that is located at the lower right corner for a better view. The scales

are 800, 400, 200, 96, 48, 24, 12, 6, 3, 1.5, 0.75, 0.5, 0.25, 0.125 and 0.05 (nm).

- AIS target symbol description: AIS target symbols are described below (refer to Table 4-3-1-1).

Table 4-3-1-1 AIS target symbol

Own Ship	**GPS Reception: Normal / Color: Grey** Under normal GPS reception, own ship is located in the center of the radar view.
Own Ship	**GPS Reception: No GPS / Color: Grey** Without GPS reception, own ship needs to be located manually.
AIS Target 	**Color: Green** Ship equipped with AIS system in the surrounding sea will appear on the radar view as an AIS target.
Selected Target 	**Color: Green / Flashing Black Frame** Use the arrow keys to select any target on the radar view. After selected, press <ENT> and the detailed information on each target can be viewed.
Dangerous Target	**Color: Red / Circled Frame** When distance to a ship is smaller than CPA/TCPA, the target will be circled in red. Use the arrow keys to select the dangerous target and to view its detailed information.
Friend Ship	**Color: Magenta** If any pre-stored Friend Ship is nearby, the Friend Ship will appear in magenta on the radar view.
Lost Signal Target	**Color: Green / Crossed** If reception of an AIS target is lost over 10 minutes, a “**X**” will be displayed over it. The target will disappear from the Radar View if no update from the target is received for more than an hour.
AtoN (Real)	**Color: Green / Plus Sign** The icon will be displayed if any AIS AtoN (Aids to Navigation) Real is in the range of reception.
AtoN (Virtual)	**Color: Green / Plus Sign and Undercut** The icon will be displayed if any AIS AtoN (Aids to Navigation) Virtual is in the range of reception.
AtoN(Off position)	**Color: Red / Plus Sign** The icon will be displayed if any AIS AtoN (Aids to Navigation) is in off position status.

SAR	**Color: Black** The icon will be displayed if any air plane is in the range of reception.
SART	**Color: Red / Cross** The icon will be displayed if any SART message is sent out.
Base Station	**Color: Green** The icon will be displayed when any base station is in the reception range.

NOTE: The straight line extended from AIS target represents the course of the ship.

4.3.1.2 Alphanumeric View

Under this mode, all ship details will be displayed alphanumerically. To browse the entire information, please use the scroll bar on the screen to view the desired data. (Figure 4-3-1-2)

Radar View | Alphanumeric View

NO	MMSI	CLASS	RX COUNT	MSG #	NAME	CALLSIGN	RANGE	BEARING	SOG	COG	HEADING	CPA	TCPA	LAT	LON	ROT	LENGTH	BEAM	DI
Own	091602247	[B]	0	18			0.00 nm	N/A	N/A	N/A	N/A	N/A	N/A	25°08'48"N	121°45'19"E	N/A	0m	0m	N
1	416000197	[A]	5	1			0.59 nm	N/A	0.20 Kn	217.6°	235.0°	N/A	N/A	25°08'26"N	121°44'49"E	0.0°	0m	0m	
2	372627000	[A]	7	1			17.56 nm	N/A	16.70 Kn	207.0°	196.0°	N/A	N/A	25°25'17"N	121°52'01"E	-2.2°	0m	0m	
3	416317000	[A]	5	1			0.53 nm	N/A	0.00 Kn	259.1°	302.0°	N/A	N/A	25°09'02"N	121°44'48"E	0.0°	0m	0m	
4	416101000	[A]	5	1			2.57 nm	N/A	0.10 Kn	316.0°	38.0°	N/A	N/A	25°11'01"N	121°43'53"E	0.0°	0m	0m	
5	416017700	[A]	3	1			0.26 nm	N/A	0.10 Kn	285.3°	N/A	N/A	N/A	25°08'40"N	121°45'34"E	N/A	0m	0m	
6	209370000	[A]	9	1	OOCL MANILA	C4LP2	0.44 nm	N/A	0.10 Kn	244.9°	240.0°	N/A	N/A	25°08'24"N	121°45'07"E	0.0°	168m	27m	KI
7	352457000	[A]	1	3			0.32 nm	N/A	0.00 Kn	248.2°	242.0°	N/A	N/A	25°08'57"N	121°45'01"E	0.0°	0m	0m	
8	371655000	[A]	7	1			21.06 nm	N/A	9.30 Kn	183.0°	180.0°	N/A	N/A	25°06'48"N	122°08'29"E	N/A	0m	0m	

LENGTH	BEAM	DESTINATION	ETA	SHIPTYPE	CARGO
0m	0m	N/A	N/A	(0)Undefined sh	(0)N/A; Harmles
0m	0m		0/0 00:00	(0)Undefined sh	(0)N/A; Harmles
0m	0m		0/0 00:00	(0)Undefined sh	(0)N/A; Harmles
0m	0m		0/0 00:00	(0)Undefined sh	(0)N/A; Harmles
0m	0m		0/0 00:00	(0)Undefined sh	(0)N/A; Harmles
0m	0m		0/0 00:00	(0)Undefined sh	(0)N/A; Harmles
168m	27m	KEELUNG	11/30 22:30	(70)Cargo ship	(70)N/A; Harmle
0m	0m		0/0 00:00	(0)Undefined sh	(0)N/A; Harmles
0m	0m		0/0 00:00	(0)Undefined sh	(0)N/A; Harmles

Figure 4-3-1-2 Alphanumeric View

- **MMSI:** Marine Mobile Service Identity.
- **CLASS:** AIS Message class type:

[A]: Class A AIS**,** **[B]:** Class B AIS**,**
[Base]: Base Station, **[AtoN]:** Aids to Navigation**,**
[N/A]: Unknown.

- **RX COUNT:** The numbers of receiving messages.
- **MSG # :** The message ID should identify the message type.
- **NAME:** Ship Name.
- **CALL SIGN:** Ship's Call Sign.
- **RANGE:** The distance between target ships to own ship. The unit of range is "nm" (Nautical Mile).
- **BEARING:** The relative angle between target ship and own ship.
- **SOG:** Speed Over Ground, the unit of SOG is "kn" (knot).
- **COG:** Course Over Ground.
- **HEADING:** The heading of the target ship.
- **CPA:** Distance to Closest Point of Approach, the unit of CPA is "nm" (Nautical Miles)
- **TCPA:** Time to Closest Point of Approach, the unit of TCPA is "min" (Minutes).
- **LON:** Longitude of the target ship.
- **LAT:** Latitude of the target ship.
- **ROT:** Rate Of Turn.
- **LENGTH:** The length of the target ship, the unit of LENGTH is "m" (meters).
- **BEAM:** The beam of the target ship, the unit of BEAM is "m" (meters).
- **DESTINATION:** The destination of the target ship.
- **ETA:** Estimated Time of Arrival, (Month/Date/Hour/Minutes)
- **SHIPTYPE:** Ship type of the target ship.
- **CARGO:** Cargo information.

4.3.2 Area 2: Main Menu

This area contains the main menu bar of the AIS Viewer.

4.3.2.1 File

Click on **"File"**, and the window will show as the picture below. (Figure 4-3-2-1-1)

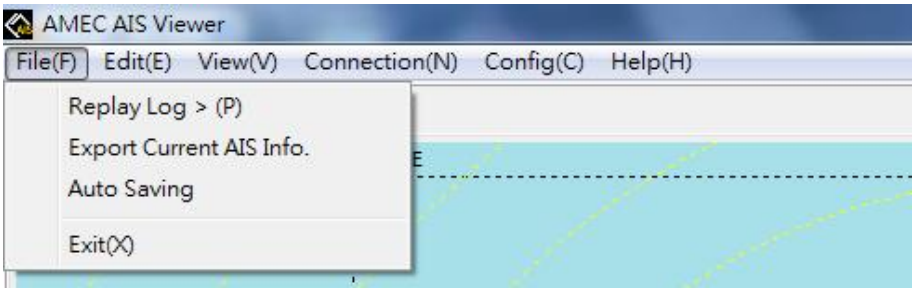


Figure 4-3-2-1-1 Commands under File

- Click on **"Replay log"** to open and replay a previously saved data.*
  To Save Log, please refer to section **4.3.2.3 View →"Log"**
- Go to **"File"** / **"Pause Play II"** to pause the file display.
- Go to **"File" / "Stop Play !"** to stop the file display.
- Click on **"Export Current AIS Info."** to export the AIS data as a Microsoft Excel file (CSV).
- Click on **"Auto Saving"** to enable an auto saving function. User can set file path, time settings in the window. (Figure 4-3-2-1-2)
- Click on **"Exit"** to close the AMEC AIS Viewer program.

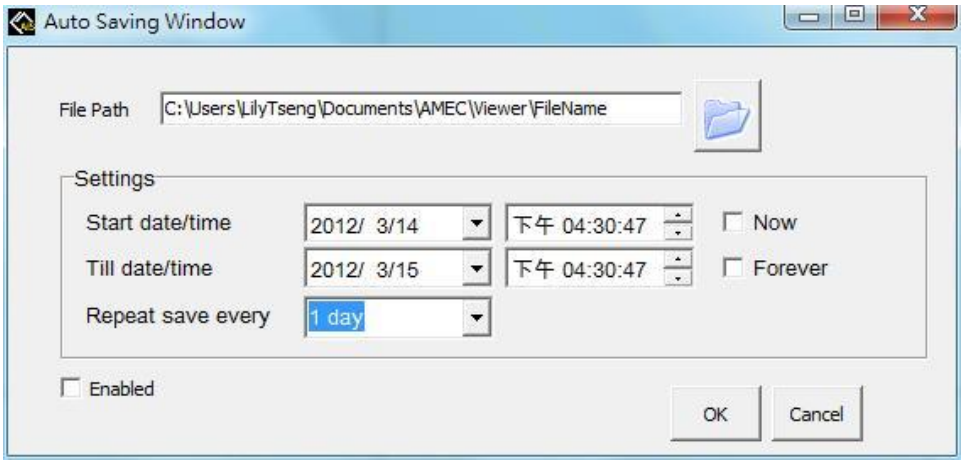


Figure 4-3-2-1-2 Auto Saving

***NOTE:** Before replaying the log data, user should go to **"Connection"→ "Disconnect AIS"** and **"Connection"→ "Disconnect GPS"** to disconnect both AIS and GPS.

4.3.2.2 Edit

Click on **"Edit"**, and the window will show as the picture below. (Figure 4-3-2-2-1)

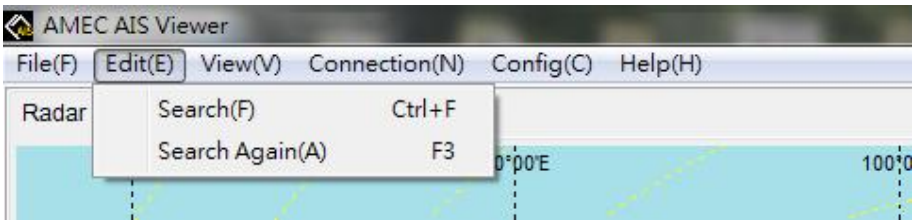


Figure 4-3-2-2-1 Menu Tree under View

"**Search**": To find the vessels by searching their MMSI or ship name. (Figure 4-3-2-2-2)

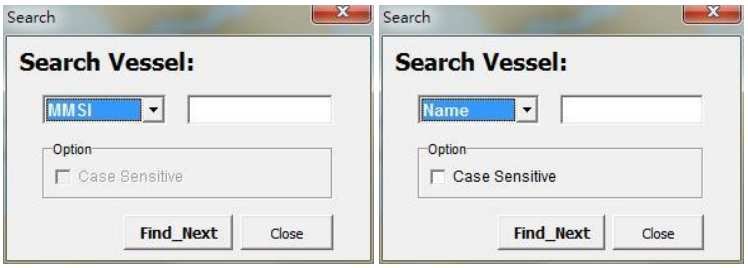


Figure 4-3-2-2-2 Vessel Searching Function

"Search Again": To repeat searching, press "F3" on the keyboard.

4.3.2.3 View

Click on **"View"**, and the window will show as the picture below. (Figure 4-3-2-3-1)

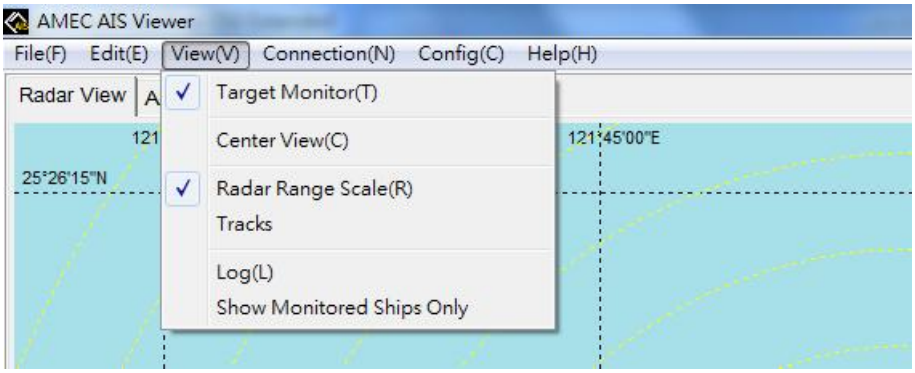


Figure 4-3-2-3-1 Commands under View

"Target Monitor": To monitor the vessel information of the selected target.

"Center View": There are two scenarios under this viewing mode, **1)** without GPS data input **2)** with GPS data input. When having no GPS input, user may select this viewing mode and the Viewer would calculate an estimated position to center your own ship on the Radar display. User may also set the own ship position manually (Refer to **Section 4.3.2.5 "Manual positioning"**). Please refer to **Section**

4.3.1.1 “Radar View” for more viewing options. With the availability of GPS data input, the Viewer will set your own ship as the center on the Radar display automatically and hence the **“Center View”** would be invalid.

“Radar Range Scale”: To show the radar range scale on the radar view.

“Tracks”: To see the tracks of the vessels. Right click the target and set the track visible/invisible. (Figure 4-3-2-3-2)

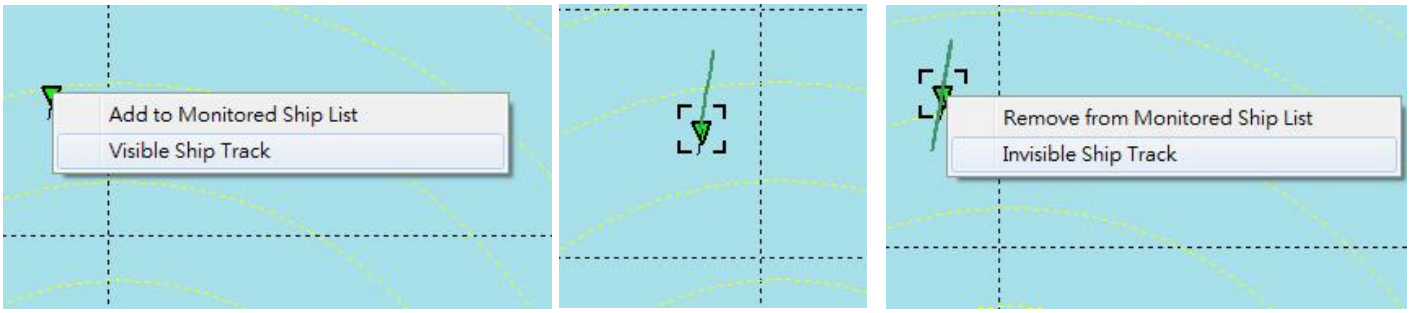


Figure 4-3-2-3-2 Visible/Invisible track

“Log”: Click on **“Log”**, and a log window will popup as the picture shows below. Select **“Enable Log”** to display the collected data in the log box. You may click on **“Save”** to save the data or click on **“Clear”** to delete it. (Figure 4-3-2-3-3)

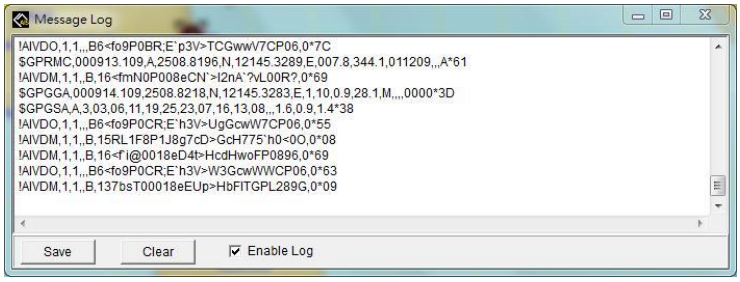


Figure 4-3-2-3-3 Message Log

“Show Monitored Ships only”: To show monitored ships only. Please refer to **4.3.2.5 Config** for more information about ship monitoring.

4.3.2.4 Connection

Click on **“Connection”**, and the window will show as the picture below. (Figure 4-3-2-4-1)

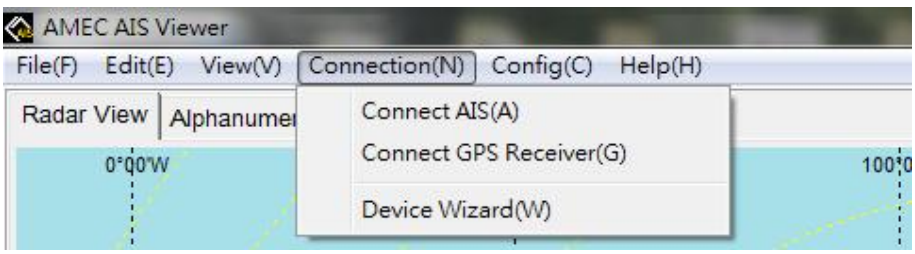


Figure 4-3-2-4-1 Commands under Connection

“Connect AIS”: When selected, a window for serial port configuration pops up. On the window select the proper “Serial Port” number and the desired “Baud Rate”*. Click on **”Connect”** to connect the desired AIS serial port. And then click on **”Close”** to complete the setting. (Figure 4-3-2-4-2)

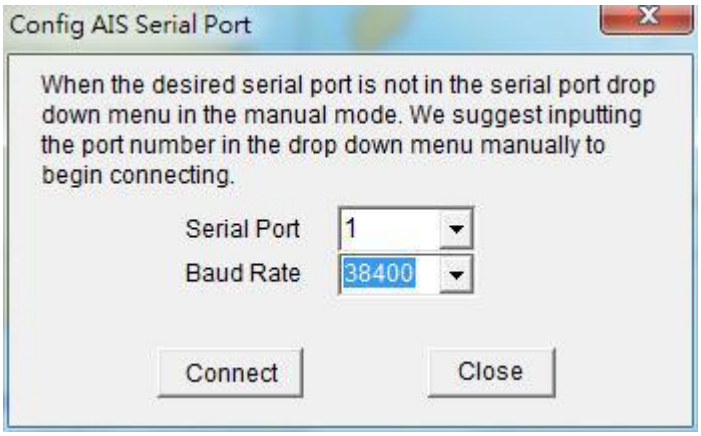

Config AIS Serial Port
When the desired serial port is not in the serial port drop down menu in the manual mode. We suggest inputting the port number in the drop down menu manually to begin connecting.
Serial Port
1
Baud Rate
38400
Connect
Close

Figure 4-3-2-4-2 Config AIS Serial Port

***NOTE: The CAMINO-101 default Baud Rate is 38,400.**

“Connect GPS Receiver”: When selected, a window for GPS serial port configuration will popup. Select the suitable “Serial Port” number and “Baud Rate” value for your GPS. Click on **”Connect”** to connect GPS serial port. And then click on **”Close”** to complete the setting. (Figure 4-3-2-4-3)

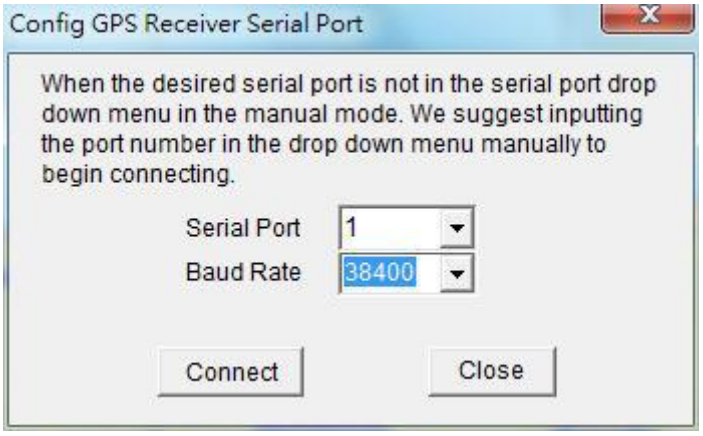

Config GPS Receiver Serial Port
When the desired serial port is not in the serial port drop down menu in the manual mode. We suggest inputting the port number in the drop down menu manually to begin connecting.
Serial Port
1
Baud Rate
38400
Connect
Close

Figure 4-3-2-4-3 Config GPS Receiver Serial Port

“Device Wizard”: This command will guide user to select appropriate serial port and baud rate..

4.3.2.5 Config

Click on **“Config”**, and the window will show as the picture below. (Figure 4-3-2-5-1)

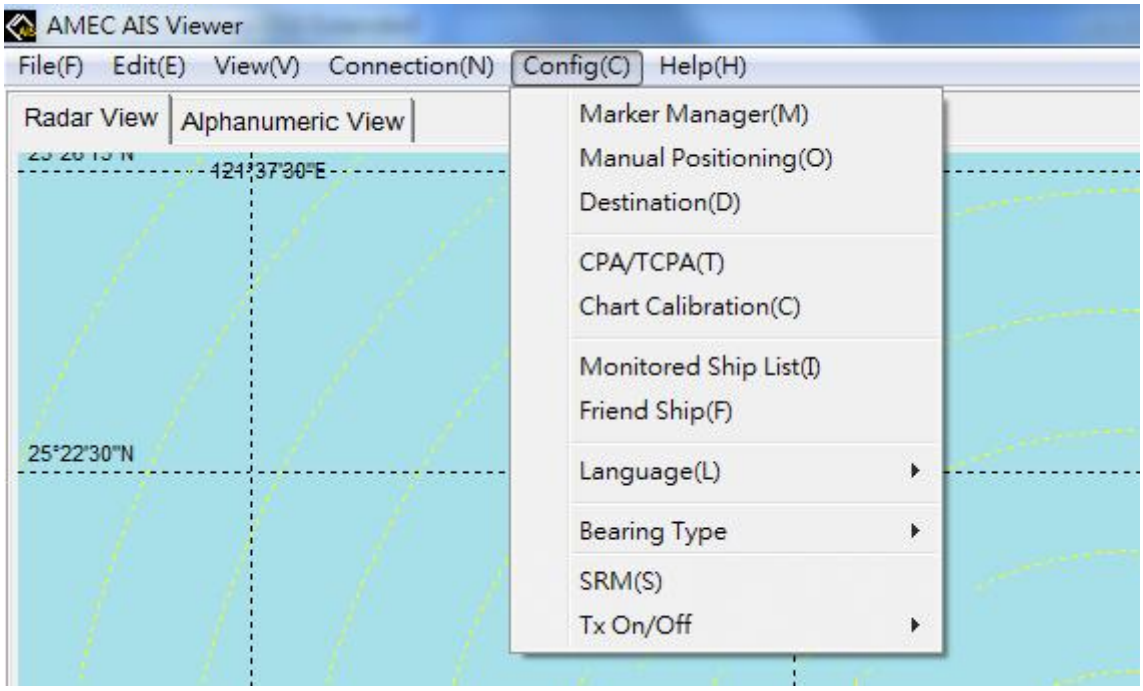


Figure 4-3-2-5-1 Commands under Config

"Marker Manager": User can manage markers in the Marker Manager window.
To add a marker, simply right click the desired position on the display and click **"Add marker here"** (Figure 4-3-2-5-2)

.

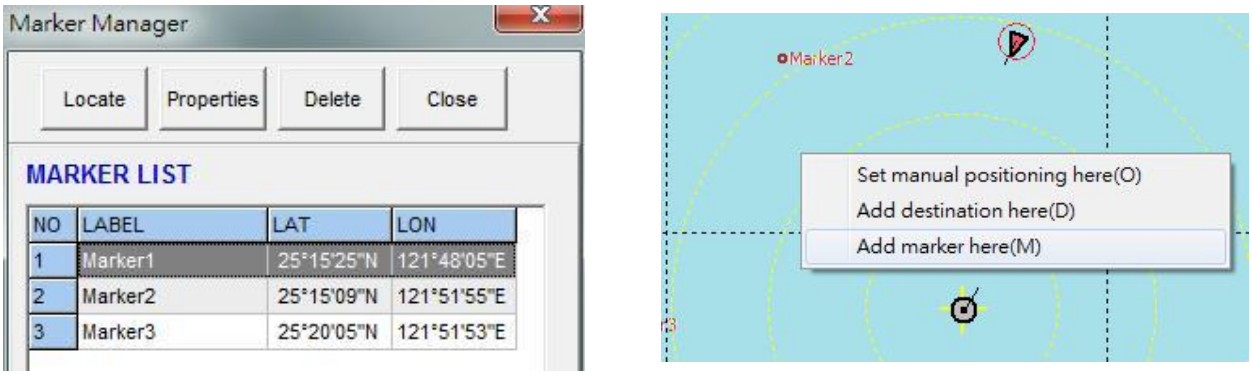


Figure 4-3-2-5-2 Marker Manager

- **Locate:** The selected marker will be centered on the display.
- **Properties:** To edit the selected marker's name and positions in this window.
- **Delete:** To delete the selected marker in this window.
- **Close:** To close the Marker Manager.

***NOTE:** On the map, if you want to add a marker, simply right click on your mouse the desired position and select **"Add marker here"**. You can also select **"Set manual positioning here"** to set ship's position and **"Add destination here"** to set the destination

“Manual positioning”: User can manually enter the position of your vessel as the center of the Radar display when GPS position is unavailable. To right click the desired position on the display and click **“Set manual positioning here”** can also finish the setting. (Figure 4-3-2-5-3)

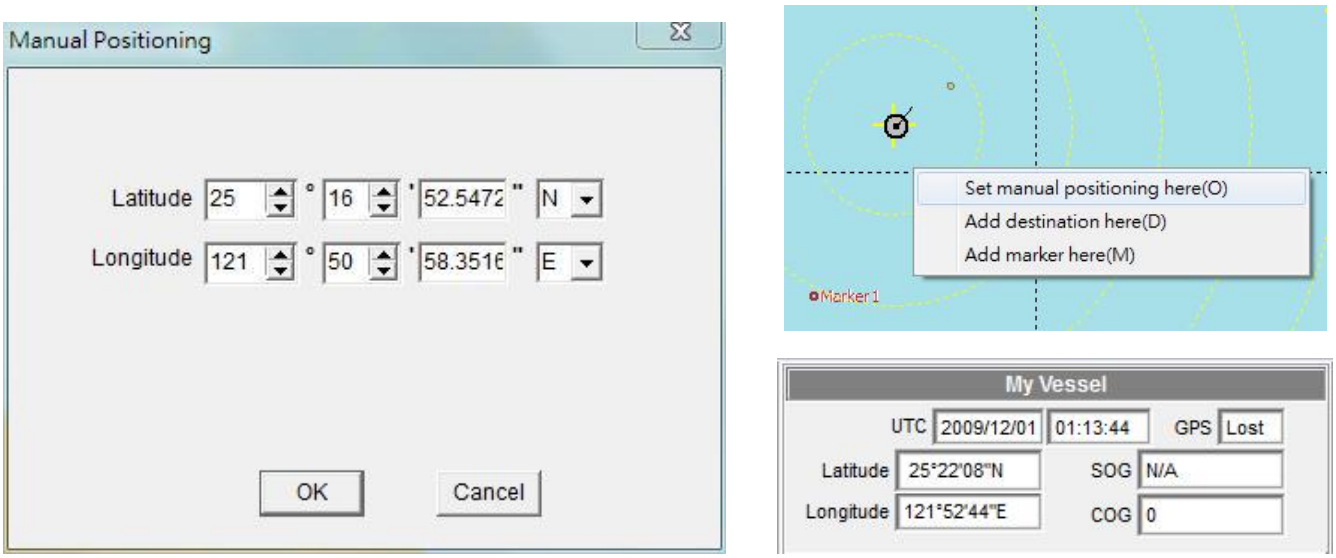


Figure 4-3-2-5-3 Manual Positioning

“Destination”: After checking the **“Configure Destination”,** user could enter the name, longitude and latitude of your destination. After that, please click on **“OK”** to complete the setting, then a red pin will be displayed at the destination location. (Figure 4-3-2-5-4)

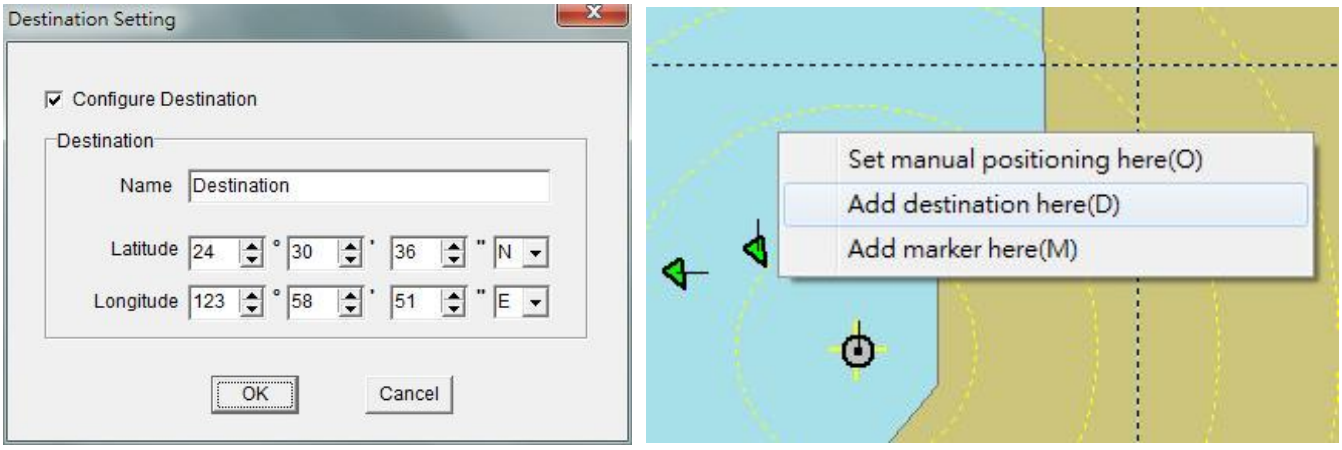


Figure 4-3-2-5-4 Destination Setting

“CPA/TCPA” (Distance to Closest Point of Approach / Time to Closest Point of Approach): User can set the CPA and TCPA according to your requirement*. When a ship is entering the alert area, it would be marked in red color (Refer to **Section 4.3.1.1 “Radar View”**). Click on **“OK”** to complete the setting. (Figure 4-3-2-5-5)

- **nm:** Nautical Mile; min: Minute

***NOTE:** **(1)**This function is invalid without GPS data input.

(2) Although the CPA/TCPA can be set on AMEC AIS Viewer, the CYPHO-101 device and AMEC AIS Viewer do not support any audible alarm interface (for sending audible alert).

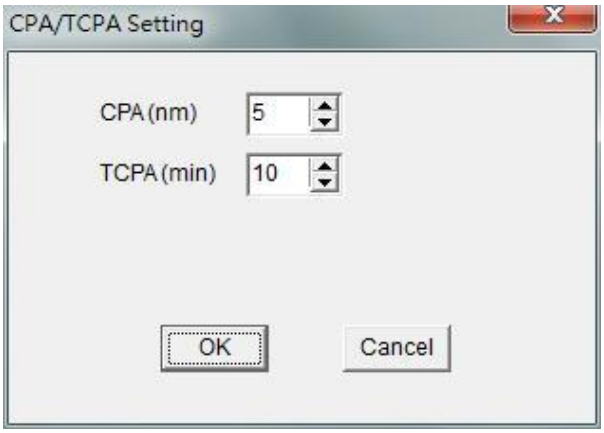


Figure 4-3-2-5-5 CPA/TCPA Setting

“Chart Calibration”: User can adjust the calibration of AMEC Viewer. To set up the calibration value, click “Enable Chart Calibration” and enter the desired value. (Figure 4-3-2-5-6)

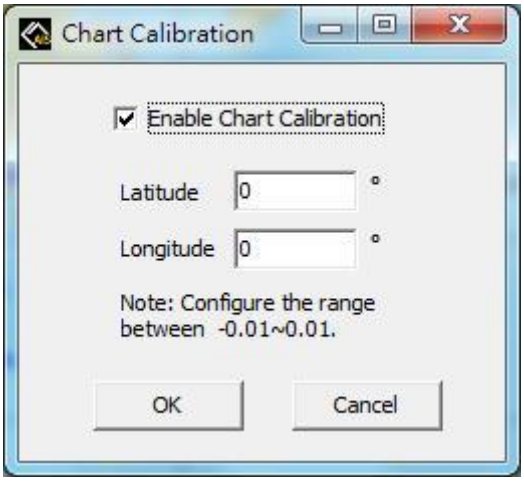


Figure 4-3-2-5-6 Chart Calibration Setting

"Monitored Ship List": User can check the monitored ships information in this window, or move cursor to the target ship for the tooltop. (Figure 4-3-2-5-7)

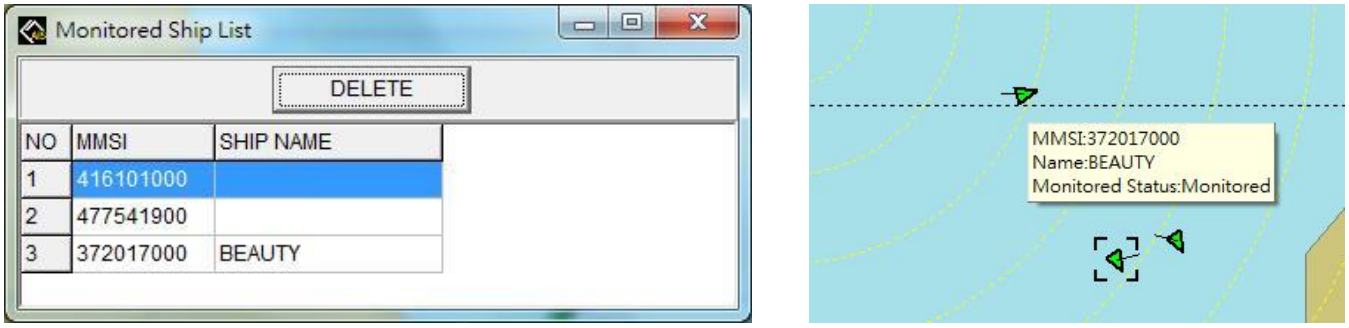


Figure 4-3-2-5-7 Monitored Ship List / Monitored Status

NOTE: To add a target ship into the Monitored Ship List, move the cursor onto the target ship and right click **"Add to Monitored Ship List".** To remove the target ship from the list, right click **"Remove from Monitored Ship List"**. (Figure 4-3-2-5-8)

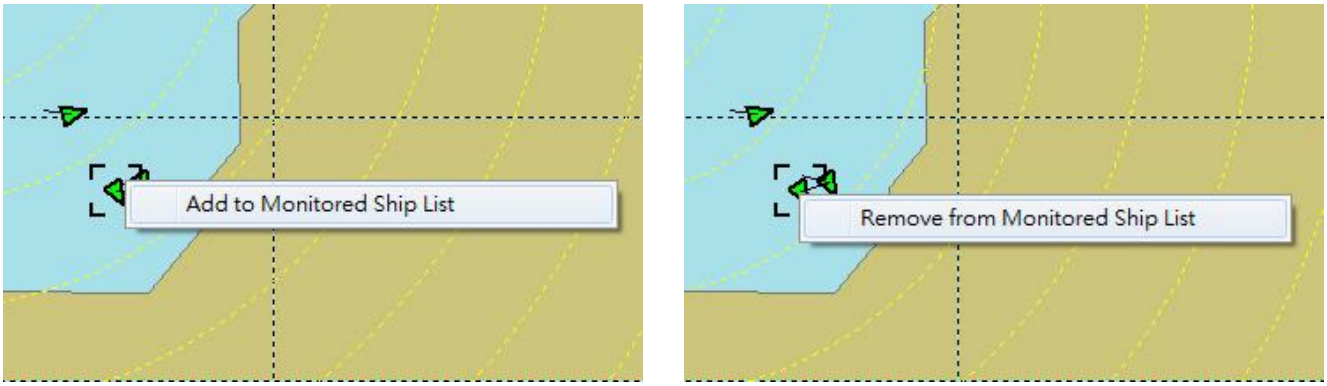


Figure 4-3-2-5-8 Add to / Remove from Monitored Ship List

"Friend Ship": User can set specific ships as friend ships by simply entering the MMSI number and a "**Y**"***** at "Friend" column; the icon of the selected targets will turn to pink in the Radar display (Refer to **Section 4.3.1.1 "Radar View"**). Click on **"OK"** to complete the setting. (Figure 4-3-2-5-9)

***NOTE:** A **"Y"** mark in the friend ship column represents the meaning of **"Yes"**.

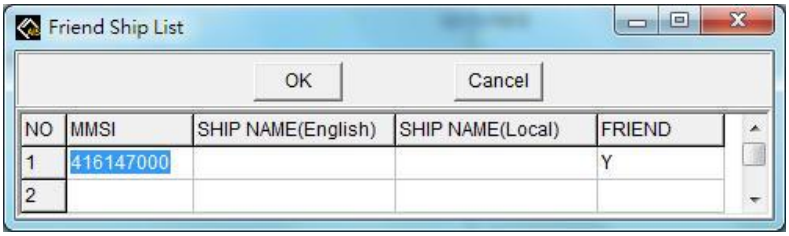


Figure 4-3-2-5-9 Friend Ship List

Language: To change the AMEC AIS Viewer display in English or another language. (Figure 4-3-2-5-10)

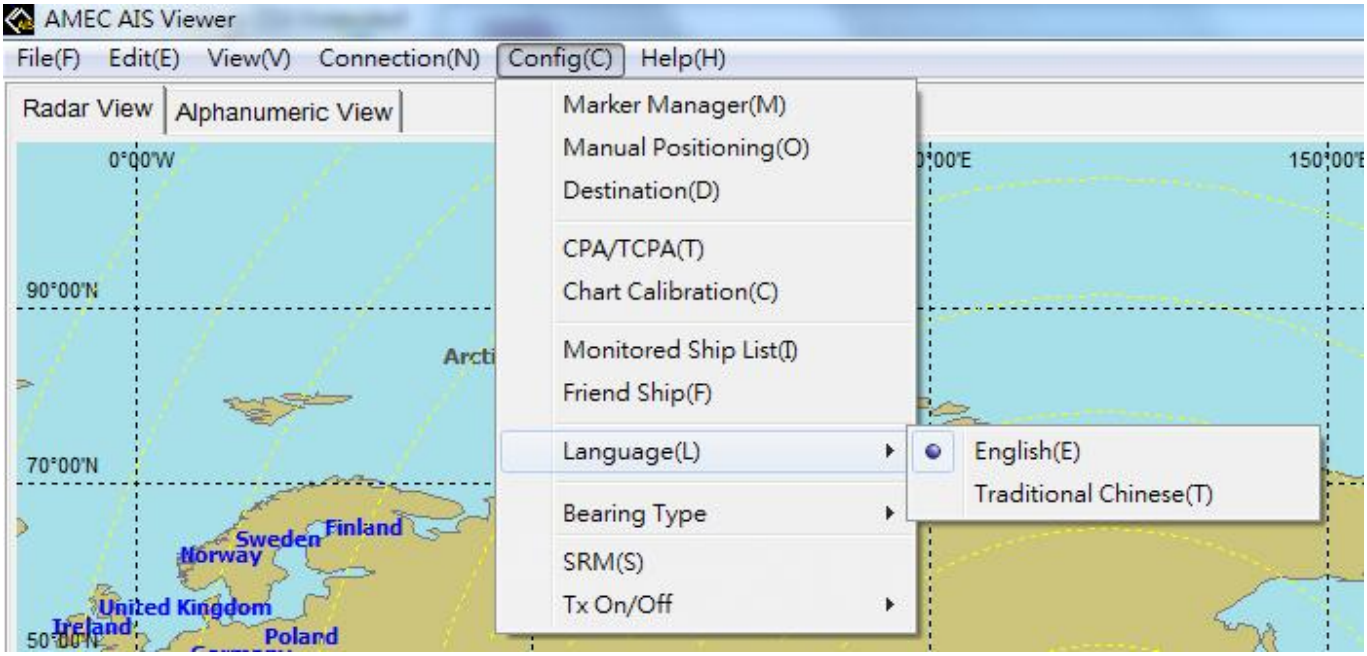


Figure 4-3-2-5-10 Language Selection

"Bearing Type": User can set **"True Bearing"** or **"Relative Bearing"**. (Figure 4-3-2-5-10)

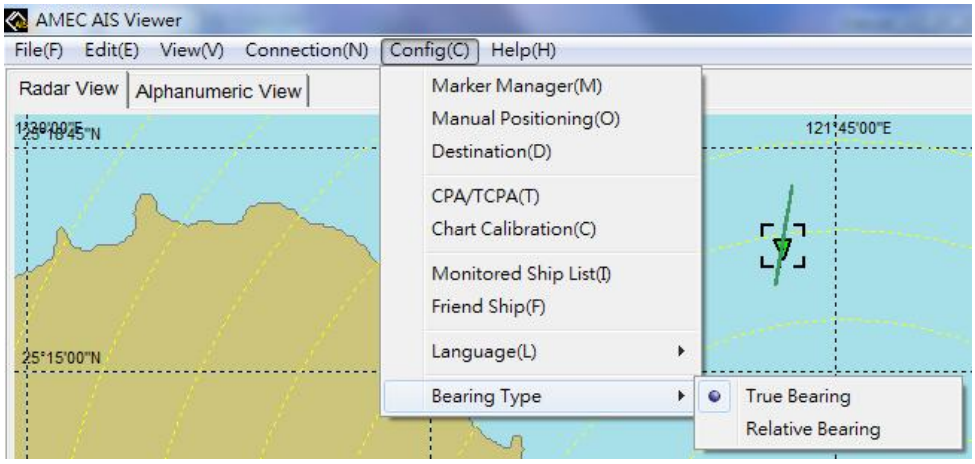


Figure 4-3-2-5-11 Bearing Type

- **True Bearing:** Uses actual north direction to calculate bearings of all vessels.
- **Relative Bearing:** All bearings of ships are calculated based on your ship's COG.

NOTE: The bearing status will be shown on the bottom of the Viewer window. To check the bearing value, please refer to **4.3.5.1 Vessel Information**.

"SRM(S)": User can select the type of Safety Related Message or key in the message manually.

Click

to send the message out*. The In-box and Out-box message will show up automatically upon clicked. (Figure 4-3-2-5-12)

***NOTE:** **Upon clicked, the device sends out the SRM message once in a minute as regulated. If you want to send out the next message, you have to wait for one minute of elapse time as shown on the window.**

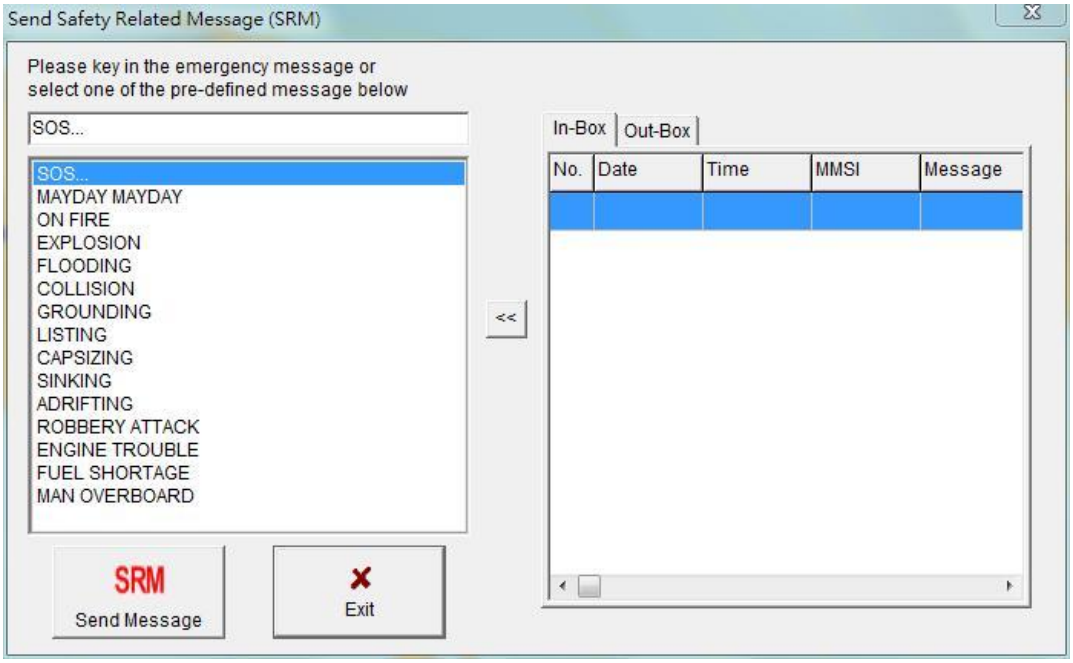


Figure 4-3-2-5-12 SRM message window

"Tx On/Off": User can select Tx Off to disable the AIS transmission. The device will enter into Silent Mode. To restore the AIS transmission, simply select the Tx On. (Figure 4-3-2-5-13) (Figure 4-3-2-5-14)

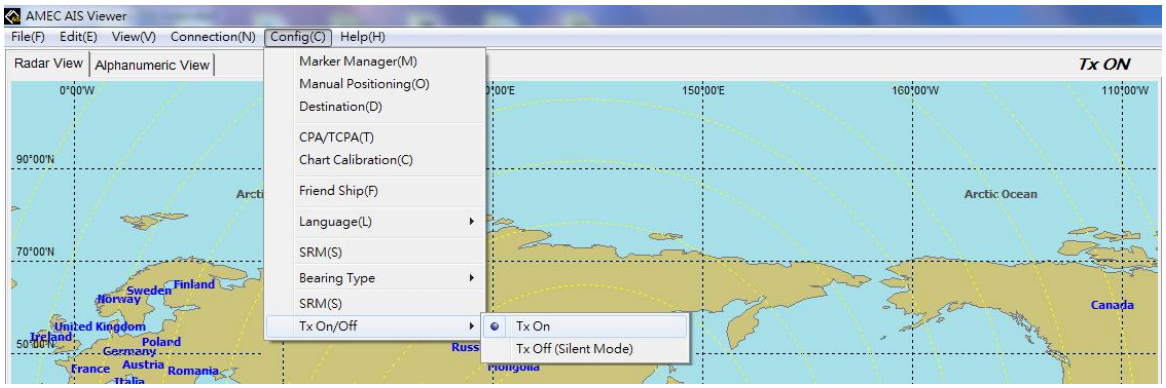


Figure 4-3-2-5-13 Tx On

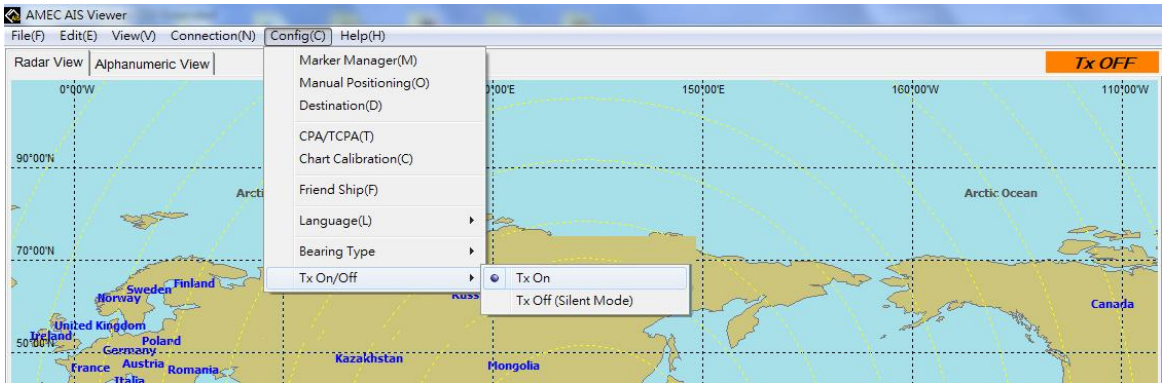


Figure 4-3-2-5-14 Tx Off

NOTE: As a safety mechanism, if AMEC AIS Viewer has not received any updated information from a linked CAMINO-101 unit for more than a period of 60 seconds, AMEC AIS Viewer will automatically switch into Tx Off mode with a warning sign (Figure 4-3-2-5-15), despite that the unit was previously set in Tx On mode. User can click on the sign ⚠ to check the warning message (4-3-2-5-16).

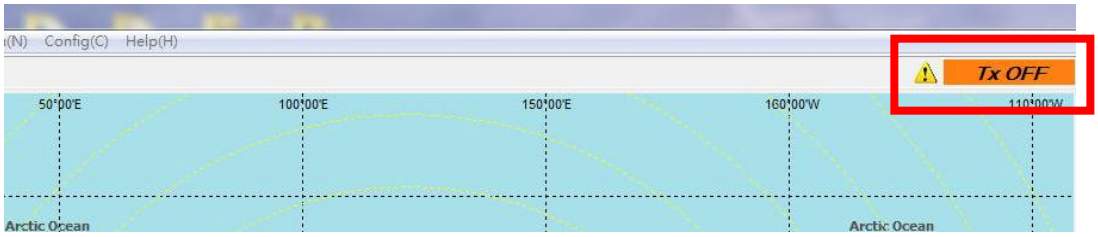


Figure 4-3-2-5-15 Connection Error

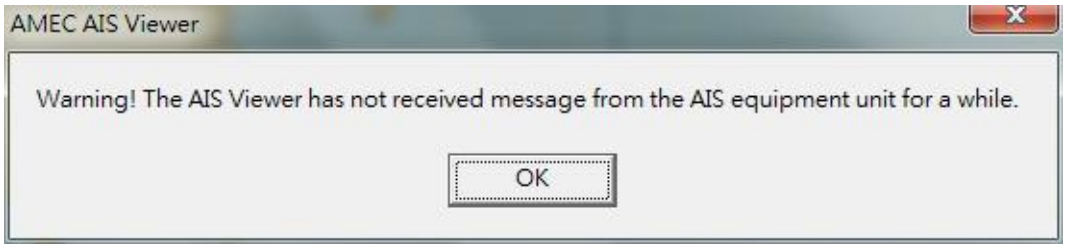


Figure 4-3-2-5-16 Warning Message

4.3.2.6 Help

Click on “About”, and the window will pop up as below (Figure 4-3-2-6-1).

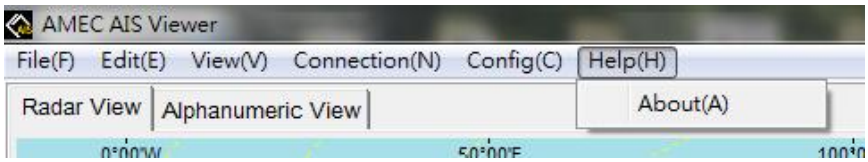


Figure 4-3-2-6-1 Commands under Help

“About”: Shows the information of the software including the established date and the software version. (Figure 4-3-2-6-2)

AMEC AIS Viewer
Ver 2.20 Build20120307
Copyright 2006 - 2012
All rights reserved.
All parts of the Software, including program and packaging, documentation, and other related items are Copyright of Alltek Marine Electronics Corporation.
Alltek Marine Electronics Corporation.
www.alltekmarine.com
OK

Figure 4-3-2-6-2 About AMEC AIS Viewer

4.3.3 Area 3: My Vessel’s position information

User’s own ship information is displayed in this window. (Figure 4-3-3)

Figure 4-3-3 My Vessel Position Information

- **UTC:** Coordinated Universal Time.
- **GPS:** GPS related information. Usually it would indicate 2D or 3D to show the accuracy of the GPS data. (3D is more accurate)
- **Latitude:** Current Latitude of user’s own ship.
- **Longitude:** Current Longitude of own ship.
- **SOG:** Speed Over Ground.
- **COG:** Course Over Ground.

4.3.4 Area 4: Ship List

In this window, it shows the MMSI, class type, and name of the target ships. (Figure 4-3-4)

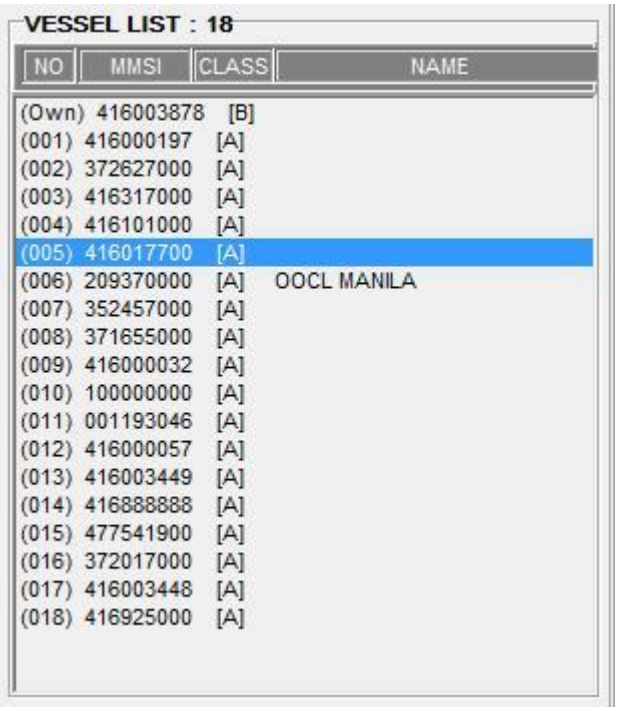


Figure 4-3-4 Ship List

- **SHIP LIST:** The numbers indicates the total received targets, excluding user's own ship.
- **NO.:** The order numbers of the received targets.
- **MMSI:** Maritime Mobile Service Identity.
- **CLASS:** It shows the AIS class type of received targets;
  [A]: Class A AIS, [AtoN]: Aids to Navigation,
  [B]: Class B AIS, [N/A]: Unknown.
  [Base]: Base Station,
- **NAME:** The name of the target ship.

4.3.5 Area 5: Ship Details Information

This area shows the dynamic and static of the vessel information, AtoN information, and GPS satellite information.

4.3.5.1 Vessel Information

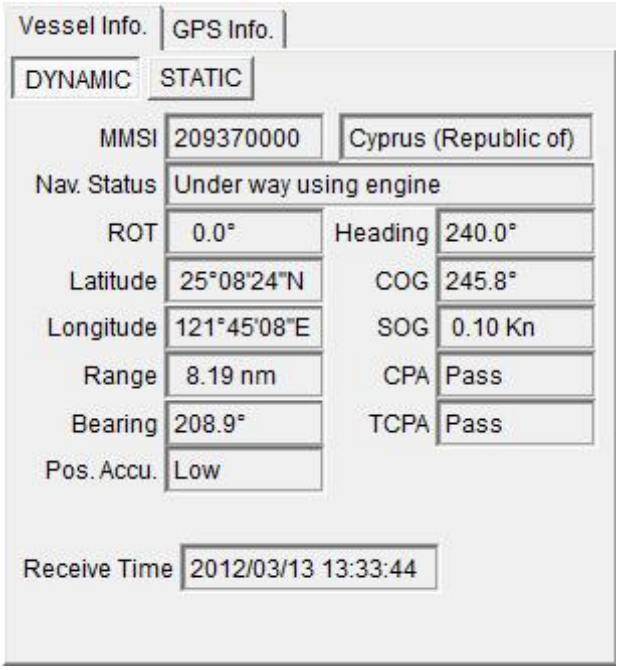


Figure 4-3-5-1-1 Dynamic Data

DYNAMIC:

- **MMSI:** Maritime Mobile Service Identity of the target ship and its country code.
- **Nav. Status:** Navigational status of the target ship.
- **ROT:** Rate Of Turn.
- **Heading:** The direction of the target ship's stem.
- **Latitude:** Current Latitude of target ship.
- **Longitude:** Current Longitude of target ship.
- **COG:** Course Over Ground.
- **SOG:** Speed Over Ground.
- **Range:** Range between the selected target and user's own ship.
- **Bearing:** The related position between user's own ship and target ship. The unit of bearing is degree(°).
- **CPA:** Distance of Closest Point of Approach between user's own ship and target ship.
- **TCPA:** Time to Closest Point of Approach between user's own ship and target ship.
- **Pos. Accu.:** Position Accuracy; related to the GPS device used.
- **Received Time:** The latest received time of the target ship.

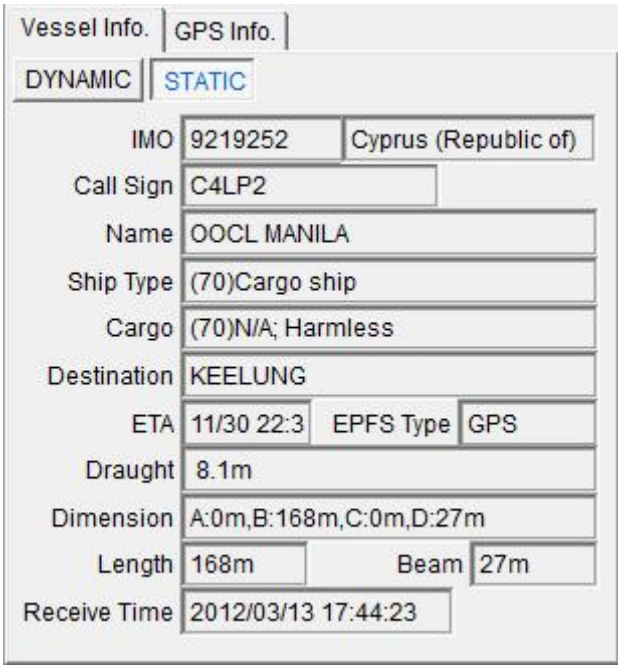


Figure 4-3-5-1-2 Static Data

STATIC:

- **IMO:** International Marine Organization Number and its country code.
- **Call Sign:** The call sign of the target ship.
- **Name:** The name of the target ship.
- **Ship Type:** The type of the target ship.
- **Cargo:** Cargo information of the selected target ship.
- **Destination:** The destination of the selected target ship.
- **ETA:** Estimate Time of Arrival.
- **EPFS Type:** Type of Electronic Position Fixing device.
- **Draught:** The draught of the target ship.
- **Dimension:** The dimension of the target ship.
- **Length:** The length of the target ship.
- **Beam:** The width of the target ship.
- **Receive Time:** The latest received time of the target ship.

4.3.5.2 AtoN Information

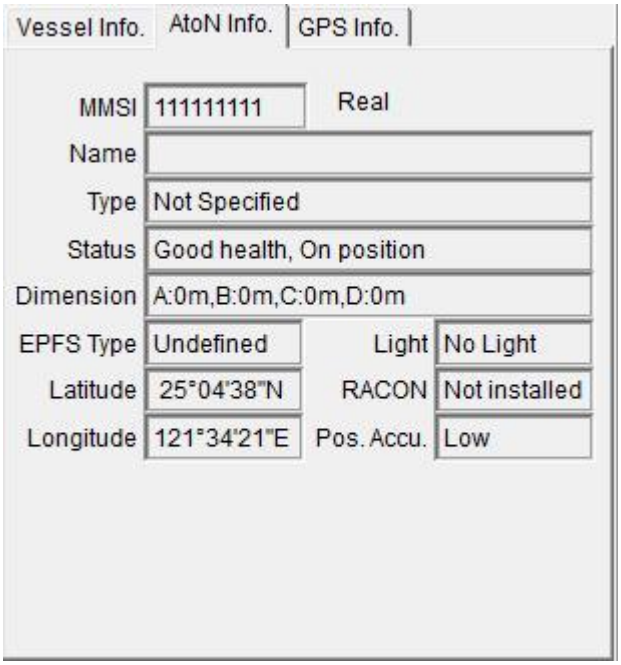


Figure 4-3-5-2 AtoN Status

- **MMSI:** Maritime Mobile Service Identity of the AIS AtoN.
- **Name:** The name of the AIS AtoN.
- **Type:** The type of the AIS AtoN.
- **Status:** The status of the AIS AtoN.
- **Dimension:** The dimension of the AIS AtoN.
- **EPFS Type:** Type of Electronic Position Fixing device.
- **Light:** The light of the lantern.
- **Latitude:** Current Latitude of the AIS AtoN.
- **Longitude:** Current Longitude of the AIS AtoN.
- **RACON:** Radar Beacon.
- **Pos. Accu.:** Position Accuracy; related to the GPS device used.

NOTE: The AtoN information details will show up when user click on the AIS AtoN icon (Refer to Section 4.3.1.1 "Radar View") that shows on the Radar View.

4.3.5.3 GPS Information

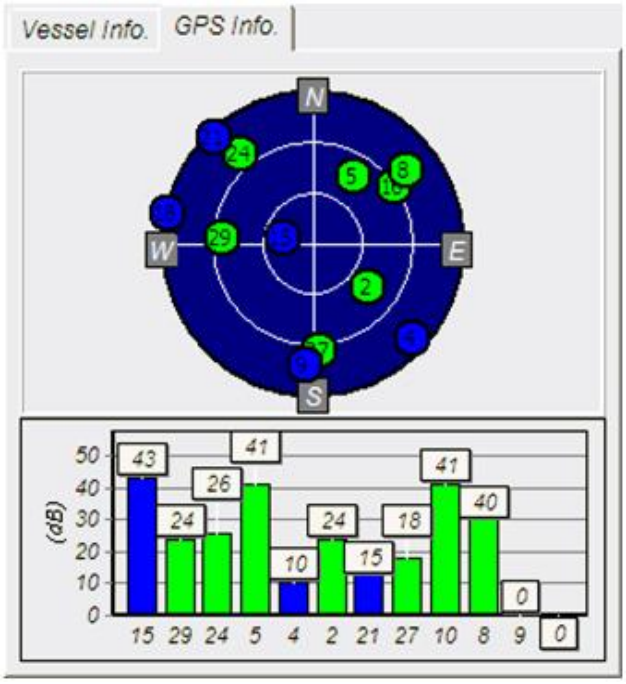


Figure 4-3-5-3 GPS Satellite Status

- The spots and bars that are shown in green indicate GPS satellite signals are used for position fix.
- The spots and bars that are shown in blue indicate GPS satellite signals received, which are not being used for position fix.

5 APPENDIX

5.1 Product Specifications

AMEC CAMINO-101 SPECIFICATIONS

APPLICABLE STANDARDS

IEC 62287-1 Ed. 2, 2010	IEC 61108-1 Ed. 1, 2003
IEC 61162-1 Ed. 3, 2007	IEC 60945 Ed. 4, 2002
IEC 61162-2 Ed. 1, 1998	ITU-R M.1371-4, 2010

VHF TRANSCEIVER

Frequency Range	156.025 MHz~162.025 MHz
Channel Bandwidth	25 KHz
Modulation	GMSK / FM
Data Rate	9.600 bps
Number of AIS Transmitter	1
Number of AIS Receiver	2 (one time-shared between AIS and DSC)
Number of DSC Receiver	1 (time-shared between AIS and DSC)
AIS Channel 1	CH 87B (161.975 MHz)
AIS Channel 2	CH 88B (162.025 MHz)
DSC Rx Channel	CH 70 (156.525 MHz)
Tx Power Output	2 Watt (33 dBm ± 1.5 dB)
Transmission Spectrum	IEC 62287-1 compliant
Rx Sensitivity	＜-107 dBm @ 20% PER
Rx Message Format	AIS Class A & B message

DSC RECEIVER

Modulation	1,300 Hz / 2,100 Hz FSK
Data Rate	1,200 bps ± 30 ppm
Spurious Response Rejection	≧ 70 dB for signal @ -104 dBm; BER ≦1%
Blocking	≧ 84 dB for signal @ -104 dBm; BER ≦1%

GPS RECEIVER (integrated)

Receiving Channels	48 channels
Accuracy	IEC 61108-1 compliant
Output Rate	1 Hz

POWER SUPPLY

Supply Voltage	12V / 24V DC
Power Consumption	Less than 4W average @ 12VDC

LED INDICATION

Power LED	(dual color)	System OK, Silent mode, Tx timeout, Error, BIIT alarm
Channel 1 LED	(dual color)	Transmitting / receiving AIS data
Channel 1 LED	(dual color)	Transmitting / receiving AIS data

CONNECTION INTERFACE

GPS Antenna Connector	TNC (Female)
VHF Antenna Connector	PL-259 (Female)
NMEA0183 (RS 422)	IEC 61162-1 / IEC 61162-2, Baud rate 38,400 (default), programmable, Input/output at same baud rate
RS-232	Baud rate 38,400 (default), programmable
Silent Mode Switch Input	Via Tx-Off Switch Box (Optional)
Alarm Output	Relay contact
Wireless Connection	Bluetooth (Optional)

ENVIRONMENTAL

Operating Conditions	IEC 60945 “protected” category
Operating Temperature	-15°C~55°C
Storage Temperature	-25°C~70°C
Operating Humidity	95% RH at 40°C
Vibration, EMI, ESD	IEC 60945 compliant
Waterproof	IPX5
Compass Safe Distance-Standard Magnetic	0.45 m
Compass Safe Distance-Steering Magnetic	0.30 m

PHYSICAL

Width	140 mm (5.51 inch)
Height	50 mm (1.91 inch)
Depth (include connectors)	200 mm (8.66 inch)
Weight	870 g

SOFTWARE TOOL

AMEC AIS Configuration	Configuration utility on PC, standard supply in CD
AMEC AIS Viewer	AIS Viewer on PC, standard supply in CD

AMEC AGGRESSOR-21 GPS Antenna SPECIFICATIONS (Optional)

GENERAL

Center Frequency	1575.42 ± 2 MHz
Gain	30 dB, typical (excluding cable)
Noise Figure	1.5 dB, typical
Bandwidth	2 MHz min.
Axial Ratio @ Zenith	3 dB max.
VSWR	1.2 typical (1.5 max)
Output Impedance	50 ohm

ENVIRONMENTAL

Operating Temperature	－25°C to ＋55°C
Relative Humidity	40% to 95% non-condensing
Storage Temperature	－25°C to ＋70°C
Water Resistance	In accordance with IEC 60945, exposed
Operating Temperature	－25°C to ＋55°C

PHYSICAL

Dimensions	90.5 mm (diameter) × 108.5 mm (H)
Ground Size	74 mm (diameter)
Weight	150 grams (without cable)
Connector	TNC (female)
Cable	10 m, RG-58 cable included

5.2 Dimensions

Front View

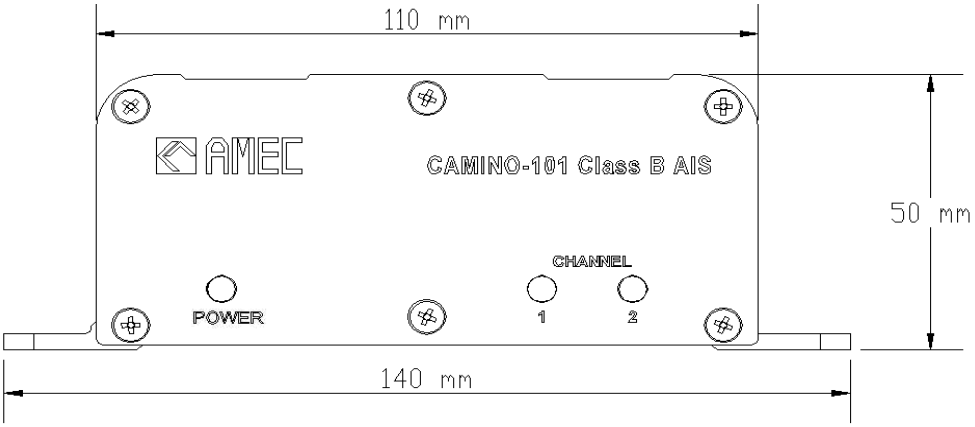


Figure 5-2-1 CAMINO-101 Front View

Top View

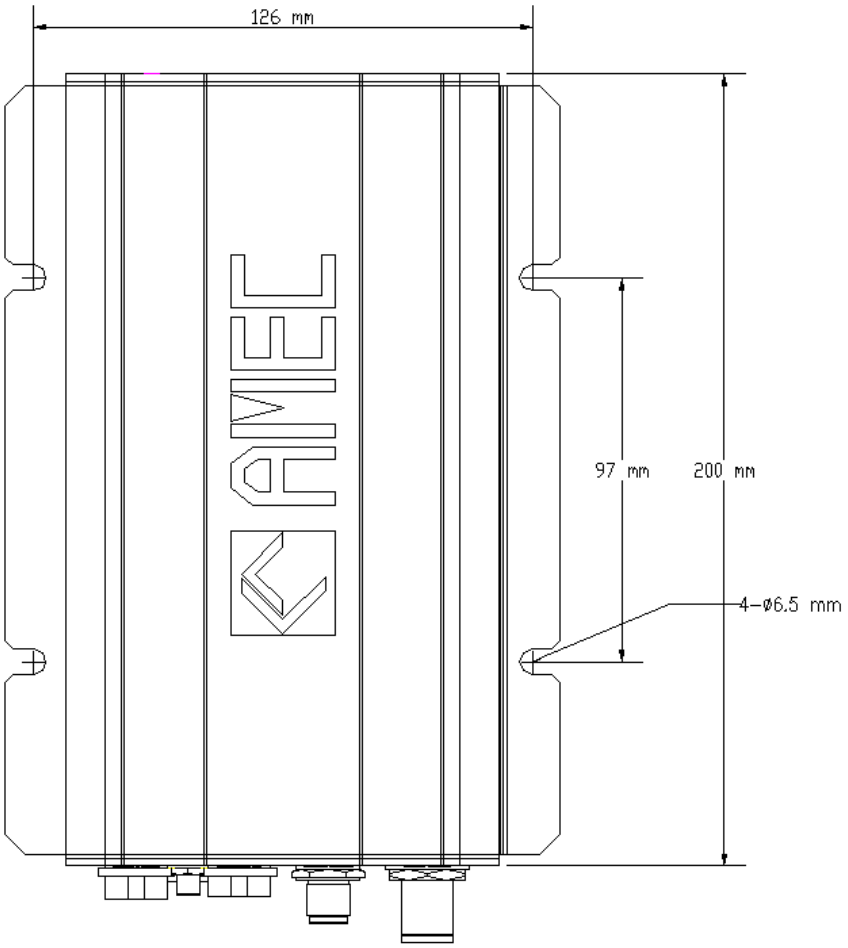


Figure 5-2-2 CAMINO-101 Top View

Side View

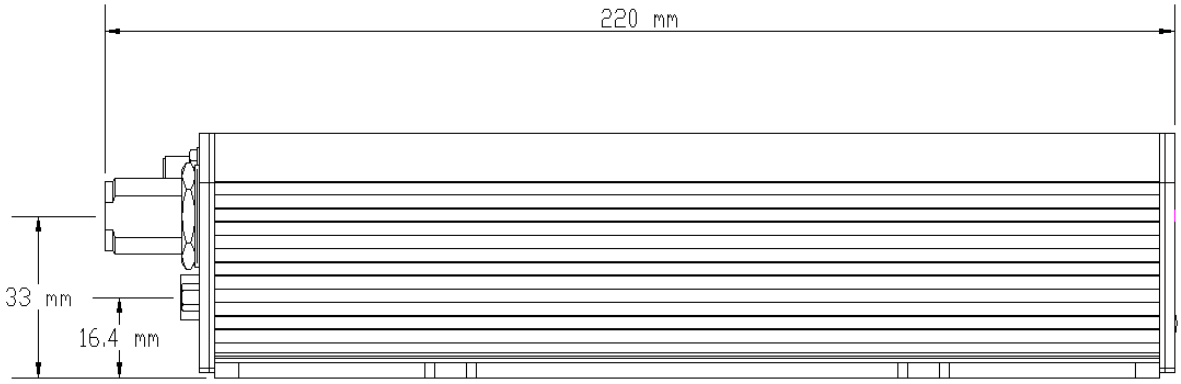


Figure 5-2-3 CAMINO-101 Side View

5.3 Ordering Information

Table 5-4 Accessories

Item	Model Name	Description
1	**CAMINO-101**	Standard AIS Class B transponder, silent mode configurable via AMEC AIS Configuration software tool;
2	**CAMINO-101A**	Standard AIS Class B transponder, silent mode configurable via AMEC AIS Configuration software tool, silent mode switchable via optional Tx-Off Switch Box;
3	**CAMINO-101W**	Standard AIS Class B transponder with Bluetooth function, silent mode configurable via AMEC AIS Configuration software tool, silent mode switchable via optional Tx-Off Switch Box;

5.4 Accessories

The following accessories are available from AMEC. Contact our local dealer/agent for more details.

Table 5-4 Accessories

Item	Description	Product Code	Remark
1	VHF Antenna	TENTA-11	Length: 1,200 mm
2	GPS Antenna	AGGRESSOR-21	Dimension: 90.5 mm(Diameter) x 108.5 mm(H)
3	VHF/GPS Combo Antenna	TENTA-12	Length: 1,680 mm

5.5 Trouble Shooting

5.5.1 Diagnosis by LED Indicators

- The power indicator changes to different color indicating its current status. User is able to make a general analysis based on the status described below,

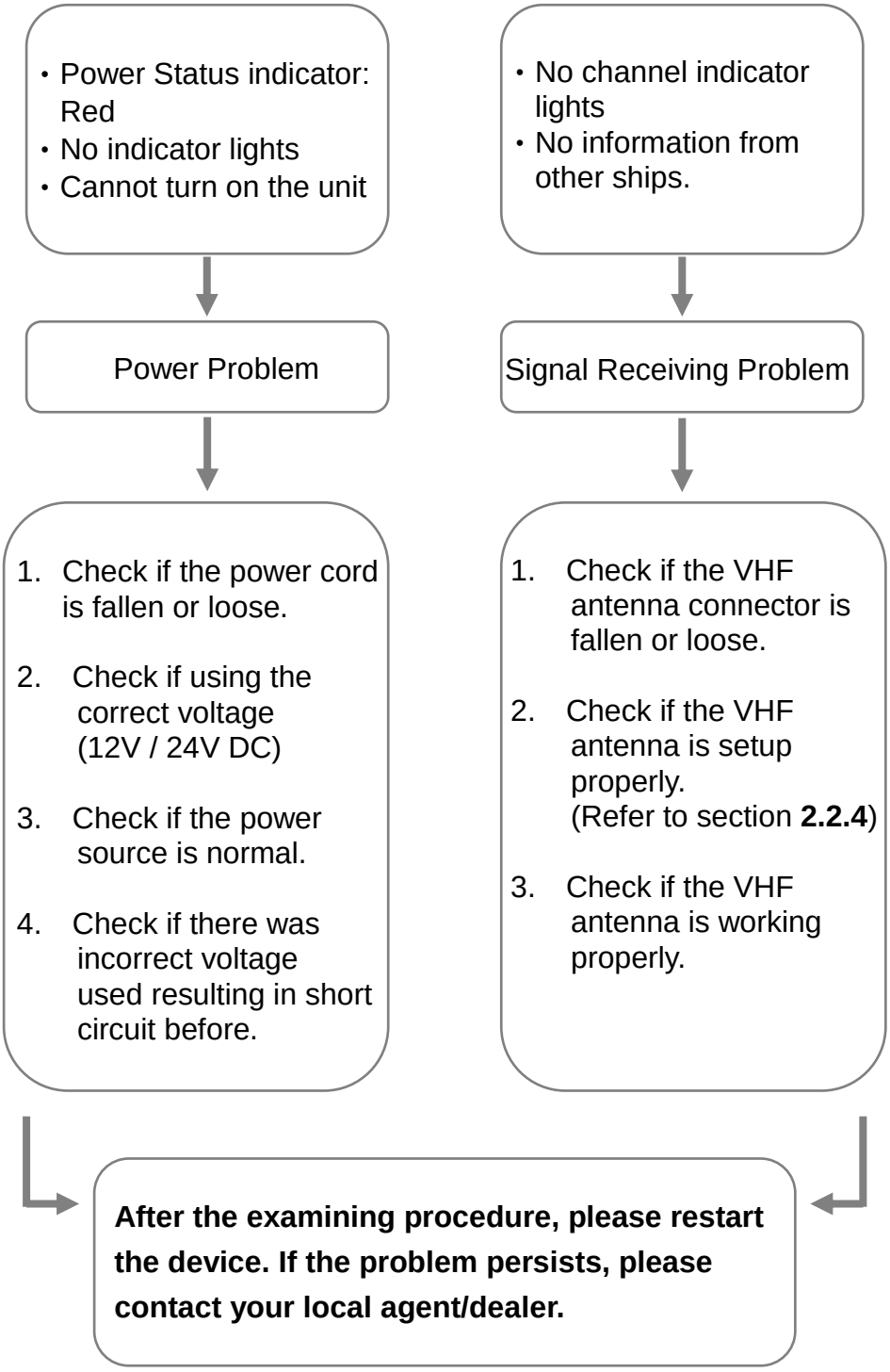
Table 5-5-1 Power LED indicator

POWER LED INDICATOR			
Color	**Status**	**Indications**	**Descriptions**
Orange	Steady	Silent mode	(1) No MMSI data is input (2) Tx Off Mode
Orange	Flash	TX timeout	Quiet mode commanded by harbor authorities or due to High VDL load
Red	Steady	Power Error	Power system is in failure
	Flash	BITT alarm	An abnormal condition of the device is detected during BIIT (Built In Integrity Test)

- If the problem persists (Power LED indicator still in red), please follow the steps below to restart the unit.
  1. **Disconnect the power cord off the unit, reconnect after 1~2 minutes.**
  2. **Please Refer to section 3.1 to turn on the unit.**

- If the problem still persists, contact your local agent/dealer.

5.5.2 Problem Analysis


• Power Status indicator: Red
• No indicator lights
• Cannot turn on the unit
Power Problem
1. Check if the power cord is fallen or loose.
2. Check if using the correct voltage (12V / 24V DC)
3. Check if the power source is normal.
4. Check if there was incorrect voltage used resulting in short circuit before.
• No channel indicator lights
• No information from other ships.
Signal Receiving Problem
1. Check if the VHF antenna connector is fallen or loose.
2. Check if the VHF antenna is setup properly. (Refer to section 2.2.4)
3. Check if the VHF antenna is working properly.
After the examining procedure, please restart the device. If the problem persists, please contact your local agent/dealer.

- Power Status Indicator: Orange
- Signal data cannot be received by other vessels

Signal Transmitting Problem

1. Check if the power status indicator HAVING STEADY ORANGE LIGHT.
   - No MMSI data input
     Please check the MMSI input data.

2. Check if the power status indicator FLASHES ORANGE.
   - Transmission is suspended by the harbor authorities or due to high VDL load.

3. Check if the channel indicator FLASHES ORANGE.
   - VHF antenna works improperly
     Check if the VHF antenna connector is fallen or loose, and see if it sets up properly.
   - Class B signal cannot be interpreted by a less updated Class A device
     Software upgrade for Class A device may be needed.

After the examining procedure, please restart the device. If the problem persists, please contact your local agent/dealer.

6 AMEC WORLD WIDE WARRANTY

Limited warranty

Subject to the terms, conditions and limitations set forth in this Worldwide Limited Warranty (hereinafter the “Warranty”), AMEC warrants that its products, when properly installed and used, will be free from defects in material and workmanship for a period of twelve (12) months, from the date of first purchase (the ‘Warranty Period’)

For the purposes of this warranty, ‘date of first purchase’ means the date that the product was purchased by the first retail customer, or by the institutional customer, or in the case of a product installed on a new vessel or any other marine related platform by a certified AMEC original equipment manufacturer (a ‘AMEC OEM’), the date that such vessel was purchased by the first retail customer.

AMEC will, at its sole option, repair or replace any defective products or components returned during the Warranty Period in accordance with the terms, conditions and limitations set forth below. **Such repairs or replacement will be the sole remedy of the customer under this Warranty.**

Standard Warranty Service

To qualify for standard warranty service the product must be returned to a AMEC-certified service agent (i) within the Warranty Period, and (ii) within thirty (30) days of the alleged product failure. Any products returned must be securely packaged and sent pre-paid and insured to AMEC or to a AMEC-certified service agent. All products returned must be accompanied by a copy of the original sales receipt to be eligible for standard warranty service.

Obtaining Warranty Service

A list of AMEC-certified service agents is available from AMEC Technical Support at www.alltekmarine.com

Other conditions

This Warranty is fully transferable provided that you furnish the original proof of purchase to the AMEC -certified service agent. This Warranty is void if the label bearing the serial number has been removed or defaced.

Limitation and Exclusions

In addition to any other limitations and exclusions set forth herein, AMEC is not responsible for, and this Warranty does not cover:

Failure due to abuse, misuse, accident, unauthorized alteration, modification or repair, improper installation or operation (whether or not by a AMEC-certified service agent) or improper storage, shipping damage or corrosion;

Costs associated with routine system checkouts, alignment/calibration, sea trials or commissioning;
Defects or damage that result from the use of non-AMEC branded or certified products, accessories or other peripheral equipment, including without limitation housings, parts, or software;
Aftermarket software (i.e. all software other than the original operating software sold with the products);
Products that have been refurbished, reconditioned, or remanufactured (The foregoing does not apply to products repaired or replaced pursuant to the terms of this Warranty).
Products that have been dismantled resulting in the broken label on the Products;
costs associated with overtime or premium labor costs;
differences in material, coloring or size that may exist between actual products and the pictures or descriptions of such products in our advertising, advertising literature or on the Internet;

TO THE EXTENT PERMITTED BY APPLICABLE LAW, THE FOREGOING WARRANTY IS AMEC'S SOLE WARRANTY AND IS APPLICABLE ONLY TO NEW PRODUCTS PURCHASED WORLDWIDE. THE PROVISIONS OF THIS WARRANTY ARE IN LIEU OF ANY OTHER WRITTEN WARRANTY, WHETHER EXPRESSED OR IMPLIED, WRITTEN OR ORAL, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

THE LIABILITY OF AMEC TO A CUSTOMER UNDER THIS WARRANTY, WHETHER FOR BREACH OF CONTRACT, TORT, BREACH OF STATUTORY DUTY OR OTHERWISE SHALL IN NO EVENT EXCEED AN AMOUNT EQUAL TO THE TOTAL PURCHAE PRICE OF THE PRODUCT GIVING RISE TO SUCH LIABILITY AND IN NO EVENT SHALL AMEC BE LIABLE FOR SPECIAL, INCIDENTAL, CONSEQUENTIAL OR INDIRECT DAMAGES OR LOST OF GOODWILL, REPUTATION, LOSS OF OPPORTUNITY OR INFORMATION, DATA, SOFTWARE OR APPLICATIONS.

SOME JURISDICTIONS DO NOT ALLOW EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFICLEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS, WHICH VARY FROM JURISDICTION TO JURISDICTION.

This Warranty supersedes and replaces all previous Warranties.
In the event that any term or provision contained in this Warranty is found to be invalid, illegal or unenforceable by a court of competent jurisdiction, then such provision shall be deemed modified to the extent necessary to make such provision enforceable by such court, taking into account the intent of the parties.

No oral or written representations made by AMEC or any seller, reseller or distributor of the products, including employees and agents thereof, shall create any additional warranty obligations, increase the scope, or otherwise modify in any manner the terms of this Warranty.

All AMEC products sold or provided hereunder are merely aids to navigation. It is the responsibility of the user to exercise discretion and proper navigational skill independent of any AMEC product.

7 FEDERAL COMMUNICATION COMMISSION INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures：

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions： (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

8 DECLARATION OF CONFORMITY

Hereby, Alltek Marine Electronics Corp. (AMEC) declares that this CAMINO-101 is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

9 INDUSTRY CANADA NOTICE TO USERS

AMEC cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product.

Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation of the device.

10 ABBREVIATIONS

AIS	Automatic Identification System
COG	Course Over Ground
CPA	Distance to Closest Point of Approach
CSTDMA	Carrier-Sense Time Division Multiple Access
DSC	Digital Selective Calling
ECS	Electronic Chart System
ETA	Estimated Time of Arrival
GPS	Global Positioning System
IMO	International Maritime Organization
MMSI	Maritime Mobile Service Identity
SOG	Speed Over Ground
SRM	Safety Related Message
TCPA	Time to Closest Point of Approach
TDMA	Time Division Multiple Access
UTC	Coordinated Universal Time
VHF	Very High Frequency
VTS	Vessel Traffic Services